

**Photoshop 2.5**  
Speed, quality of color separations improved

**LaserWriter Pro**  
Apple keeps competitive with new 600-dpi printers

**ArtZ**  
New Wacom digitizing tablet sets new standard

See Page 45

## Mac OS to invade PC space

*Apple may launch 486 version this year*

By Robert Hess

Cupertino, Calif. — An experiment under way at Apple may let users of high-end PCs boldly go where no Intel-based computer has gone before.

Code-named Star Trek, the project is a rewrite of System 7.1 designed to give users of IBM PCs and compatibles an alternative to Microsoft Windows, sources said. The system reportedly will run on any PC that uses an Intel 486 and

meets other hardware requirements. The project, according to sources, is an offshoot of an older skunkworks effort to explore whether it would be possible to get the Mac operating system to work on the Intel architecture. Once that project demonstrated the feasibility of the idea, Apple officials reportedly decided to pursue it seriously. Several software-development teams were recently combined into a larger group dedicated to bringing Star Trek to market this year.

But the company has not made a final commitment to release the software, sources said.

See Star Trek, Page 112



Adobe Illustrator 5.0 will add floating palettes that let users create, edit and access custom colors and unlimited layers.

## Filters, layers and preview editing add ease, power to Illustrator 5.0

By Kirsten L. Parkinson

Mountain View, Calif. — Adobe Systems Inc. this week will unveil an upgrade to Illustrator that observers say will make the PostScript illustration program significantly easier to use.

The newest release of the \$395 program, due in the second quarter, will jump from Version 3.2 to Version 5.0, according to the company. It will leapfrog Version 4.0 for Windows, which was released last May.

Features of Illustrator 5.0 include:

► **Filters:** A series of plug-in filters, comparable to those used for image processing in Adobe Photoshop, will enable Illustrator 5.0 users to create and manipulate objects quickly.

With the Pathfinder filters, users will be able to create new shapes or effects by selecting areas from several objects. For example, the Intersect filter will produce a new object

See Illustrator, Page 112

## Apple cameras will put snapshots on Mac desktop

By Matthew Rothenberg

Cupertino, Calif. — Apple is focusing on electronic color photography with a pair of handheld digital still cameras, sources said.

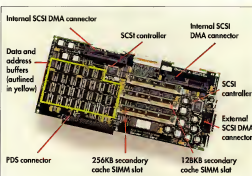
The 24-bit-color cameras, code-named Mars and Venus, are based on technology from Fuji Photo Film Co. Ltd. of Tokyo, according to sources. The devices may debut as early as August's Macworld Expo in Boston.

► **Mars:** The higher-end camera is expected to cost less than \$2,000 and support a resolution of about 450 lines. It reportedly will store images on a PCMCIA card. Users will be able to download photos to their CPU via a serial interface and transfer the card to a Newton for wireless transmission, sources said.

Mars is based on the Fujifilm DS-H2, which Fuji introduced for the Japanese market at Macworld Tokyo in February (see MacWEEK Feb. 22). The company last week said it has no plans to distribute the camera in the United States.

Fuji's device, which weighs about 1 pound, 3 ounces, can store up to 40 images on a 16-Mbit PCMCIA card. It features a 390,000-pixel RGB (red, green, blue) CCD (charge-coupled device) sensor; automatic focusing; an electronic shutter capable of speeds from 0.25 to 0.0013 seconds; and a built-in automatic flash.

See Cameras, Page 111



## New servers will bring '040 punch to Mac nets

*Three versions set for CeBIT rollout*

By Mitch Radcliffe

San Francisco — Apple this week will introduce a family of 68040-based servers that support file and print, database, backup, and groupware services for AppleTalk networks.

The company's Enterprise Systems Division will roll out three Apple Workgroup Server packages at CeBIT '93 in Hanover, Germany. The servers will be introduced along

with AppleSearch, a server-based text search-and-retrieval package (see story, Page 4).

The centerpiece of the server line, the AWS 95, is due by the end of next month. It will include a Quadra 950 with an I/O-accelerating processor direct slot card, A/UX 1.0.1, a new release of Apple's Unix operating system optimized for the server; and AppleShare Pro, a new version of the company's file and print server software, rewritten to take advantage of Unix and the PDS card.

The AWS 95 will offer more than four times the performance of

See Servers, Page 111

## News Analysis

## Servers pitched to installed base

By Mitch Radcliffe and April Streeter

San Francisco — Officials of Apple's Enterprise Systems Division described this week's rollout of the Apple Workgroup Servers as the 1-year-old division's coming-out party. Users and analysts said that while Apple's support for mostly Mac networks has noticeably matured, the company isn't quite ready to keep corporate company.

The three Apple Workgroup Servers are targeted at specific niches in Apple's fragment of the computing market. The AWS 950 is

designed to serve large workgroups of up to 200 people. The AWS 80 is positioned as a server for medium-size workgroups and as a platform for communications software, such as the new AppleTalk Internet Router and X.25, X.400 and Systems Network Architecture gateways. The AWS 60 is tuned to support Mac users in small offices and educational settings.

Traditional cadres of Mac fanatics, such as graphics and marketing departments, should snap up these

See Market, Page 111

## Special Report

### Getting ready for RISC



What to expect from Apple's PowerPCs

See Page 36

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# TECHWORKS™





**Objective Software's SpreadBase 1.1 will be bundled with Briotech's DataPrism data dipper to give users more powerful analytical capabilities when working with SQL databases.**

## SpreadBase upgrade to use DataPrism to get SQL data

By Mitch Randell

Redwood City, Calif. — Objective Software Inc. and Briotech Inc. have teamed up to give users an analytic advantage when dealing with SQL databases.

Version 1.1 of Objective's SpreadBase category-based modeling application, due next month, will be bundled with Briotech's \$399 DataPrism data dipper. The combination will let users analyze SQL data by creating ad hoc queries of information stored on Oracle, Sybase and other database servers. SpreadBase combines a spreadsheet-like interface with an internal relational database that lets users study connections between variables in a data set.

The applications will exchange data encapsulated in Structured Data Objects, which include the data value and type, as well as column headers for retrieved fields. Objective said DataPrism's ability to pass database information without stripping away relational pointers such as data type and column headers facilitates updates to an analysis.

"Tab-delimited imports eliminate the relationships in your data; that

makes importing secondary information very difficult," said Ed Forman, director of marketing at Objective.

"People who wanted to go back to the database a second time have had to write elaborate macros to maintain data types and column headers in files imported from relational databases." SpreadBase 1.1 will improve many uses and analytic capacity. The program now requires 20 Mbytes or more to conduct an analysis; Forman said Version 1.1 will require 8 Mbytes to run the same process. The new version will let users analyze 12,000 records compared with 4,000 now.

New support for Apple's Data Access Manager and Apple events will help integrate the table and database events suites in a version of SpreadBase due this summer, Objective said.

SpreadBase 1.0 costs \$695; pricing for Version 1.1 has not been set. Objective Software Inc. is at 700 Chesapeake Drive, Redwood City, Calif. 94063. Phone (415) 306-7400; fax (415) 306-7404.

Briotech Inc. is at 444 Castro St., Suite 700, Mountain View, Calif. 94041. Phone (415) 961-4110; fax (415) 961-4572. □

## Software lets admins manage via SNMP

By Nathalie Welsh

Cupertino, Calif. — Apple has added a few more brush strokes to its enterprise networking initiative with software that lets network administrators manage Macs using SNMP.

The company this month released AppleTalk Connection for Macintosh, a package that combines the latest versions of the AppleTalk stack and drivers with MacSNMP, Apple's implementation of Simple Network Management Protocol. It includes agents and MBMs (Management Information Bases) that collect information about Mac hardware and software configurations and monitor the state of network links.

To read the data users will need a

third-party SNMP console on the Mac or a Unix workstation.

AppleTalk Connection for Macintosh sells for \$39 per user; a 20-user package is due next month for \$199.

Apple also released AppleTalk Administration for Macintosh, a \$199 package that includes the Mac and network agents plus MacSNMP administrative software.

Similar to software for monitoring Macs on TCP/IP networks is due next month, TCP/IP Connection for Macintosh, including MacTCP and the MacSNMP client software, will cost \$39 per single user and \$499 for a 20-user pack. TCP/IP Administration for Macintosh will list for \$499. □

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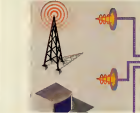
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# AppleSearch to serve data to clients

*Will let users search indexed text quickly*

By Carolyn Soid

Santa Clara, Calif. — Along with its new servers, Apple this week will roll out client-server software that provides rapid access to large amounts of textual data.

AppleSearch, due in the third quarter, stores documents in their native file format on any 68040-based server. The software, which was code-named Bogart, will use Apple's XTND technology (not the new Translation Manager, as reported last week) to open the documents and an engine developed by Personal Library Software of Rockville, Md., to index them.

Pricing has not been set.

## Apple servers bring documentation to light with bundled DocViewer

By Rakesh Chhola

Cupertino, Calif. — The servers Apple is announcing this week will come with a unique advantage for harried administrators on-line documentation. The systems will include Apple DocViewer, a new electronic publishing system developed at Apple.

The software, released on developer CD-ROMs last fall, is designed specifically for on-screen viewing of documentation. It reads documents converted from some common word processing formats with a utility Apple does not currently plan to release. Unlike TeXtEdit, the rudimentary text and picture reader for Apple, DocViewer supports formatted text, including:

- ▶ **Outline.** Users can view a hierarchical table of contents for each document, expanding items of interest to see section headings within chapters.
- ▶ **Bookmarks.** Users can select

Apple said indexing typically occurs at a rate of about 15 Mbytes (equivalent to the text in three Bibles) per hour. Indexes consume about as much space again as the original files.

Users can create "personalized reporters," or agents, to search the contents of documents using natural-language queries and/or full Boolean logic. Searches can occur at scheduled intervals or on demand. Results are returned in a list ranked by relevance to the query; they also can appear in a newspaperlike format.

Apple said it hopes to offer Windows and DOS clients but declined to set a timetable.

Apple will offer an application programming interface and newspaper-customization kit to encourage third parties to take advantage of AppleSearch in their own products. A devel-

oper could, for example, create and distribute a client interface to a dial-up database of real-estate information.

Two providers of real-time information, Dow Jones Information Services and Mainstream Data Inc., said they can see a synergy between AppleSearch and their products — DowVision and Mainstream Newscenter, respectively.

"We deliver news from a real-time news wire into [user-specified] folders. Then AppleSearch can pick up, index and make retrievable the information," said John Bennion, executive vice president of Mainstream Data in Salt Lake City. "We create the haystacks, then AppleSearch finds the needles."

Greg Smirin, project director for the Program for Management Development at the Harvard Business School in Cambridge, Mass., said, "Subscribing to any of these news feeds is like drinking from a fire hydrant." Smirin has just begun beta testing AppleSearch and hopes to use it "to control the huge mass of information provided by the Mainstream pipeline."

Smirin said AppleSearch's interface is "incredibly simple compared to the type of arcane searching methods in Nexis or other big commercial on-line databases."

However, he said, "It remains to be seen if we can turn the spigot tight enough so we get just the information that's relevant to us."

## Prices lowered on upgrade kits for Quadra, IIfx

Cupertino, Calif. — Apple last week sharply reduced the cost of several logic-board upgrades.

▶ **Quadra 700 board.** Topping the list was a 36 percent cut on the Quadra 700 upgrade kit for the Mac IIfx and IIfx. Previously \$3,129, the kit is now \$1,999.

▶ **Quadra 950 upgrade.** The Quadra 950 upgrade is now \$1,899, down from \$2,679. Available only to Quadra 900 users, it replaces the original Mac tower's 25-MHz 68040 with a 33-MHz version.

▶ **Mac IIfx.** Owners of the Mac II and IIfx can now upgrade to a Mac IIfx board for \$1,799. The six-slot upgrade was previously \$2,319.

Apple also reduced the price of the Windows configuration of its OneScanner to \$949, the same as the Mac version. The Windows version was previously \$1,059. □



TI's \$999 microWriter uses a 5-ppm Samsung LED engine and switches automatically between Adobe PostScript Level 1 and a PCL 4 emulation.

## TI to set new PostScript price low with under-\$1,000 laser printer

By Matthew Rifeberg

Austin — Texas Instruments Inc. next month will set a new price low with a PostScript laser printer that lists at less than \$1,000.

The microWriter uses a 5-page-per-minute, 300-dpi Samsung engine based on an LED engine and handles letter- or legal-size paper or transparencies. The printer switches automatically between Adobe PostScript Level 1 and a PCL 4 emulation.

It will be available in two configurations, the \$999 microWriter PS23 and the \$1,299 microWriter PS65, which will ship with 23 and 65 fonts, respectively. Users of the PS23 will be able to upgrade to the PS65.

The microWriter will ship with LocalTalk and Centronics parallel interfaces, an RS-232 serial port will be \$59.

The printer runs on a 16-MHz Motorola 68000 controller and includes a proprietary TI application-specific integrated circuit to increase imaging speed. It will come with 2 Mbytes of RAM, expandable to 4 Mbytes via a special memory board. Users will be able to update

fonts and emulations via ROM cards.

The microWriter will include a 250-sheet input tray and 200- and 30-sheet output trays. A second 250-sheet feeder will cost \$199, and a universal 50-sheet feeder will be \$99.

Digital Equipment Corp. has been offering the DEC Laser 1152, its 4-ppm Level 2 printer, for an introductory price of \$999; it lists for \$1,299. Apple's new 5-ppm LaserWriter Select 310, which includes a RISC chip and comes with Level 1, lists for \$1,079. According to sources, Hewlett-Packard Co. is working on a 4-ppm Level 2 printer that may cost less than \$1,000.

TI also announced that it has cut the prices of its microLaser line of laser printers. The 9-ppm, RISC-based microLaser Turbo now costs \$1,649, down from \$1,799, the microLaser PS35 is \$1,399, down from \$1,549, and the microLaser PS17 is \$1,249, down from \$1,499.

Texas Instruments Inc.'s Information Technology Group is at P.O. Box 202230, Austin, Texas 78720-2230. Phone (817) 771-5856 or (800) 527-3500, fax (817) 774-6660. □

## MacWrite Pro has a secret: Scriptability

By Les Piarre

Santa Clara, Calif. — Although Claris Corp. didn't know it, users have discovered that MacWrite Pro can be controlled through Apple events.

The recently released word processor responds to several Apple events sent by applications such as UserLand and Frontier 2.0 from UserLand Software Inc. of Redwood City, Calif. Users have reportedly developed a Frontier glue (installation file that maps the events to Frontier verbs) so Frontier scripts can control MacWrite Pro.

One of the program's developers secretly included support for a handful of events that add text to a MacWrite Pro document, position the cursor, find a selected range of text and change it, and read selected text. Claris had said it supported

only the four required Apple events.

MacWrite Pro will not immediately be scriptable with AppleScript, the forthcoming scripting system, AppleScript. The word processor lacks an event resource, the Apple event-naming resource that AppleScript and other Open Scripting Architecture-based systems use to determine what events an application supports.

Claris said it plans to support additional Apple events in a future release, but it made no promises regarding AppleScript scriptability or support for particular event suites.

WordPerfect for the Mac has its own built-in scripting language, controllable through the "do script" Apple event. Microsoft Corp. has promised to add support to a future version of Word. □



Apple DocViewer, designed for reading documentation on-line, includes a table-of-contents browser (upper right) and a powerful search dialog (lower right) among other navigation tools.



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Canvas™ has never been shy about its reputation for running circles around MacDraw® Pro. But even we are stunned by just how wide the performance gap has grown. Over the last couple years, while the competition's been idling, Canvas has been pouring it on. Winning converts by the thousand. And accumulating a trophy case full of top industry awards, including two MacUser 5-Mice Ratings (no other drawing program's received even one). One look at the feature differences, and you'll understand why. Canvas offers vastly more powerful text handling tools like binding to curves, shape wrapping, full kerning control, and font-to-Bézier conversion. Unrivaled technical drawing features like auto dimensioning, parallel lines and curves, and a SmartMouse™ drawing aid. Plus sophisticated design/illustration capabilities, including object combinations and object blends. Best of all, only Canvas is self-upgrading. Our exclusive Open Architecture allows you to totally customize your work environment — turning existing tools on and off at will, and "plugging in" a steady stream of brand new ones (like our red-hot Design, Imaging, and Utility ToolPAKS™) by simply dragging them into a designated folder. Here's what MacWeek had to say about this feature in their January '93 review of Canvas: "Being able to add more than 40 tools to a program simply by copying files into a folder adds remarkable power to that program. In Canvas' case, it reinforces its position as the best object-oriented drawing program money can buy." So if you're on the fence about which program to buy, or tired of being stuck in low gear with the one you bought, just get ahold of Canvas. And you'll never look back.

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# Optix WorkFlow has new routes

*Electronically sends documents to users*

By Kirsten L. Parkison

Blint Hill, Va. — Blueridge Technologies next month will bolster its document-management system with a work-flow module for electronically routing documents along user-defined paths.

With Optix WorkFlow, a central administrator can create multiple routes for different types of electron-

ic documents. The system will then forward documents automatically to the proper person on the network.

For example, an insurance company could create routes for the various types of claims it receives. Optix WorkFlow would then send all auto-accident claims to the proper person for processing. When that user finishes work on the documents, they would be forwarded to the next person along the route, such as the person in charge of accounting.

Other features of WorkFlow include:

► **Parallel routes.** Users can set up parallel routes for tasks that can be completed simultaneously.

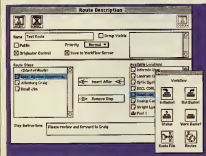
► **Ad hoc routes.** While users cannot edit the main route for a document, they can create ad hoc routes within the primary route for tasks that must be completed before they can forward the document.

► **Duration.** The administrator can assign a duration to each step on a route, and Optix WorkFlow will automatically notify the administrator and the user when a particular step is not completed in the designated time.

The program supports documents created in Mac applications as well as images scanned using the company's document-imaging software.

Optix Network, the company's document-imaging and archival system, with WorkFlow starts at \$75,000 for 10 concurrent users. WorkFlow is an add-on module to Optix Network starts at \$40,000.

Blueridge Technologies is at P.O. Box 430, Flint Hill Square, Flint Hill, Va. 22627-0430. Phone (703) 675-3015; fax (703) 675-3130. □



**Optix WorkFlow from Blueridge Technologies lets administrators create routes for users to send electronic documents to other users on the network. A duration can be assigned to each step on the route.**

## HyperScript Tools to build database front ends

*New Informix suite runs across platforms*

By Bruce Wright

Menlo Park, Calif. — Informix Software Inc. this month announced HyperScript Tools, a development environment for building Mac, Windows and Motif database applications.

HyperScript Tools will let developers build graphical database front ends that incorporate the company's forthcoming Wingz 2.0 spreadsheet, business graphics and HyperCard-like presentations.

Informix will support access to its own database servers, as well as SQL and flat-file data through

Apple's Data Access Language (DAL) and Microsoft's Open Database Connectivity (ODBC) scheme.

The HyperScript suite includes: ► **Portfolio tool.** Developers can import data onto a portfolio "canvas," which the company said is similar to a HyperCard stack. Users will be able to navigate in portfolios by clicking buttons and hyperlinked text.

► **Wingz 2.0.** The next version of Informix's spreadsheet and business graphics application, due later this year, will be bundled with HyperScript Tools. Wingz will allow importation of large data sets for analysis. Results can be displayed in a variety of charts, including 3-D views with dynamic rotation, and variable light sources.

► **Script editor.** Developers will create HyperScript applications using an English-like, event-driven language.

► **Help tool.** Context-sensitive help files can be built into end-user applications.

Relational queries can be embedded into HyperScript applications to provide preconfigured access to database information.

Mac users will also be able to access databases through DAL and

ODBC, which will be supported in an upcoming version of DAL, according to Apple.

HyperScript Tools for Windows is due in June for \$2,495. Runtime licenses will be \$400.

Pricing for the Mac version, due in the fall, is not set but will be similar to the Windows version.

Informix Software Inc. is at 4100 Bohannon Drive, Menlo Park, Calif. 94025. Phone (415) 926-6300; fax (415) 926-6593. □

## Applied '030 card accelerates entry-level Macs

By Ian G. Jacobs

Dallas — Applied Engineering last week shipped three new 68030-based accelerator cards for entry-level Macs.

The new TransWarp 4300 family, designed for the LC, LC II, Performa 400 and Color Classic, offers a 128-Kbyte static-RAM cache.

The 25-MHz TransWarp 4325 is \$349, while the 40-MHz TransWarp 4340 is \$399. The 33-MHz TransWarp 4333v comes with a port for System 7's virtual memory and costs \$449.

Applied is touting the cards as an alternative to Apple's \$599 LC III upgrade. It said, for example, that



**PixTel/EFS organizes data using the metaphor of a file room with cabinets (front window). This search "microcomputer" turned up 10 instances of "microcomputer" even though the query was misspelled.**

## Excalibur adds Mac, Intel clients to PixTel/EFS imaging system

By Carolyn Said

San Diego — Excalibur Technologies Corp. this month updated its document-imaging system, extending it to Macintosh and Intel-based clients and adding more Unix servers and a raft of new features.

Users of PixTel/EFS 3.0 scan in or electronically transfer documents to the server, where they are converted to text by optical character recognition software, or converted by filters to ASCII text; automatically indexed at rates from 500 Kbytes to 5 Mbytes per minute, depending on server platform; and compressed at a ratio of 20-to-1.

The system uses pattern recognition-based retrieval, or "fuzzy logic" searching, to let client users perform free-text queries on full-text file labels. This allows users to find information even if documents are mislabeled, queries are misspelled or OCR errors have been introduced, the company said.

PixTel/EFS 3.0, which previously ran only on Digital Equipment Corp. VAX/VMS servers, now supports Sun Microsystems Inc. SPARC-

stations and IBM Corp. RS/6000, Hewlett-Packard Co. 9000/7xx and DEC Ultrix machines as servers.

Other new features in Version 3.0 include thesaurus searching, which lets users associate synonym terms with a query; template OCR, which lets users set up OCR zones around particular areas of a page (such as articles, but not ads, in a newspaper); and launch and link, which lets users open documents with the application that created them, if it is available.

PixTel/EFS offers links to external databases such as Oracle, Informix, DEC Rdb, Sybase and Ingres. The system comes with Excalibur's own database format, which can be used instead of an external database.

Pricing varies based on configuration and number of clients but is about \$3,500 per user for up to 20 concurrent users on a VAX server and \$2,500 per user for up to 20 users on a Unix server. Pricing does not include external databases.

Excalibur Technologies Corp. is at 9255 Towne Centre Drive, San Diego, Calif. 92121. Phone (619) 625-7900; fax (619) 625-7901. □

### For the record

The March 15 issue omitted the final line of a story about Laser Communications Inc. The company's phone number is (717) 394-8634; fax (717) 396-9831.

A March 8 story on MultiAccess Computing Corp. transposed the telephone number. The correct number is (805) 964-2332.

the TransWarp 4340, which is \$200 less than the LC III upgrade, offers 64 percent better performance than the 25-MHz LC III.

The TransWarp cards have built-in expansion connectors to get the most out of the LC family's slot slots.

An optional 68882 math coprocessor is available in speeds to match the TransWarp card. The 25-MHz math coprocessor is \$109, the 33-MHz is \$114, and the 40-MHz chip is \$149. All of the accelerators include a control panel that can disable the card's static-RAM cache and control the '030's built-in data and instruction caches.

Applied said in six weeks it will

ship a video expansion board that will deliver 16-bit color on 12-, 13- and 14-inch monitors and eight-bit color on monitors up to 19 inches. At the same time, it will release an Ethernet adapter for TransWarp-equipped Macs. Pricing for the video and Ethernet options is not set.

Applied offers a step-up program whereby users can upgrade to a faster version of the TransWarp for the difference in retail costs between the old card and the purchased one.

Applied Engineering, a division of AE Research Corp., is at 3210 Bellline, Dallas, Texas 75234. Phone (214) 241-6060 or (800) 554-6227; fax (214) 484-1365. □

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NEC was the first company to successfully bring dual-speed technology to market, and now has a complete family of readers designed to fit your needs. From our external MultiSpin 74 and internal MultiSpin 84, to our lightweight, portable MultiSpin 38.



The Refrigerator 1913



NEC MultiSpin CD-ROM Reader 1992

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both the MultiSpin 74 and 84 have a 256 KB continuous flow cache that allows them to transfer encyclopedias of data at high speeds and play

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MultiSpin technology, you'll find everything else about as primitive as sending mail through the pony express. To find out more, call 1-800-NEC-INFO (in Canada 1-800-343-4418). Or, via fax, call NEC FastFacts™ at 1-800-366-0476, request 23766.



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# NEC



# Transsoft connects Macs via SCSI

*Hard disk hub gives Macs fast file access*

**By Raines Cohen**

Santa Barbara, Calif. — Transsoft Corp. last week shipped a new system that lets multiple Macs share files at SCSI speeds.

Transsoft SCSI-Net lets up to six users share access to a SCSI hard drive. The drive connects to the SCSI-Net hub and is partitioned so that each Mac has read-write access to one partition and all have read-only access to the others. A background application running on each Mac handles the partition management and mounting.

As a result, a file saved on the shared drive by one user can immediately be read by another at speeds of up to 5 Mbytes per second.

"SCSI-Net minimizes our need to network large files around our shop," said Kevin O'Neill, president of Image Axis Inc., an electronic image-retouching company in New York. "Four workstations have access at near-SCSI speeds, which is three to five times as fast as Ethernet. Every user mounts a partition on our main drive, so when we use our drum scanner and stick the file in the partition, it is immediately available for retouching."

"We found that [SCSI-Net] eliminated the need for a fiber solution for this set of workstations for the foreseeable future."

Standard Mac SCSI connections are "single-ended," which limits the total length of a SCSI chain to about 20 feet. SCSI-Net, however, supports another connection technology called "differential," which allows the chain to extend to more



than 80 feet. To take advantage of the differential option, Mac users will need either a converter such as Paralun Corp.'s Parallel-SD10 (see story, this page) or a differential adapter card, such as the Silicon-Express 3D from ATTO Technology Inc. of Amherst, N.Y.

SCSI-Net sells for \$5,995 in a six-user configuration. Purchasers can choose a system with either two standard and four differential SCSI ports or six standard connections. Although Transsoft's SCSI Director formatting software is included with the system, users can format shared partitions with other applications.

Transsoft said by August it will add support for multiple drives and communication between Macs. Once the latter is added, users will be able to choose SCSI-Net in the Network control panel and substitute it for the physical layer of an AppleTalk or other network.

Transsoft Corp. is at 31 Parker Way, Santa Barbara, Calif. 93101. Phone (805) 963-7181 or (800) 949-6463; fax (805) 963-7178.

## Paralun box lengthens SCSI chain

**By Henry Marr**

San Diego — Paralun Corp. is now offering users a way to make their SCSI chain up to 200 feet long.

The company's Parallel-SD10 is an external converter that connects single-ended SCSI cabling — the standard variety supported by the Mac and most Mac SCSI peripherals — to differential cabling. On the single-ended side of the device, cables can total up to 20 feet, on the differential side, maximum cable length is 82 feet. With one converter installed, a differential device can be more

than 100 feet away from the Mac; with two converters, a standard single-ended device can be more than 200 feet away.

The \$475 device requires no changes to existing hardware or software, according to the company. It supports the full American National Standards Institute X3T92 SCSI standard, including such advanced features as disconnect-reconnect and Fast SCSI transfers of up to 10 Mbytes per second.

Paralun Corp. is at 7171 Ronson Road, San Diego, Calif. 92111. Phone (619) 560-7266; fax (619) 560-8929.

## Latest Accel-a-Writer model offers 1,200 dpi

*Xante reduces prices on other units in line*

**By Neil McMenis**

Mobile, Ala. — Xante Corp. this month introduced its new 1,200-dpi version of the Accel-a-Writer 8100, its tablet-size laser printer.

The company also dropped the prices of some 600-dpi models by as much as 30 percent.

Accel-a-Writer 8100. Available now for \$6,695, the new 1,200-dpi Accel-a-Writer 8100 comes with 48 Mbytes of RAM, upgradeable to 64 Mbytes.

Xante still is offering a 600-dpi version with 12 Mbytes of RAM for \$3,995, an 800-dpi version with 20

Mbytes of RAM for \$4,495 and a 960-dpi version with 32 Mbytes of RAM for \$5,495 (see MacWEEK, Sept. 21, 1992).

All Accel-a-Writer 8100 models are based on Canon U.S.A. Inc.'s new 8-page-per-minute BX engine and feature a 16-MHz AMD 29000 RISC processor. They come with PhoenixPage, a PostScript interpreter from Phoenix Technologies of Norwell, Mass.; 35 Type 1 fonts; a SCSI port for a hard disk; a 250-sheet input cassette; and simultaneously active AppleTalk, Centronics parallel and RS-232 serial interfaces.

Xante will offer a free ROM upgrade to Phoenix's Level 2 interpreter shortly after Apple releases the new Level 2 LaserWriter driver

next month, the company said.

Price cuts. Xante this month reduced the price of its 8-ppm Accel-a-Writer 8000 to \$2,295, a \$1,000 reduction. The company also cut the price of its 4-ppm Accel-a-Writer 4000 to \$1,795, a \$700 drop. Both letter-size models offer a resolution of 600 dpi.

The company also cut \$500 off the price of its Accel-a-Writer Upgrade, which now retails for \$1,195. This package raises the resolution of many Apple LaserWriter and Hewlett-Packard Co. LaserJet series laser printers to 600 dpi.

Xante Corp. is at 2559 Emogene St., Mobile, Ala. 36606. Phone (205) 476-8189; fax (205) 476-9421.

## Mass Microsystems first vendor out of the gate with new SyQuest

*New 3.5" unit holds 105 MBs per cartridge*

**By Kirsten L. Perkins**

Sunnyvale, Calif. — Mass Microsystems Inc. hopes to become the first vendor to deliver the new 3.5-inch, 105-Mbyte SyQuest removable-cartridge drive to the Mac market.

Due this month, Mass's DataPak 105 will come in two forms: a \$1,049 external model and a \$949 internal drive for the Quadra 800, 900 and 950; Centris 610 and 650; Mac Ixv; and Performa 600.

The drives offer an average seek time of 14.5 milliseconds and a sustained data transfer rate of 1.7

Mbytes per second. Each drive ships with one formatted cartridge and comes with a two-year warranty and toll-free technical support. Additional DataCart 105 formatted cartridges are \$139; unformatted cartridges are \$122. The cartridges carry a lifetime warranty.

The DataPak 105, which is not compatible with either SyQuest's 44-Mbyte or 88-Mbyte drives, is being marketed as an alternative to the 3.5-inch, 128-Mbyte magnetooptical technology, Mass Microsystems said. The company's optical drive currently lists for \$1,499.

Mass Microsystems Inc. is at 810 W. Maude Ave., Sunnyvale, Calif. 94086. Phone (408) 522-1200; fax (408) 733-5499.

## ClubMac ships 5.25", half-height MO

Irvine, Calif. — The Mac mail-order company ClubMac this month shipped a high-capacity magnetooptical drive based on a 5.25-inch, half-height Sharp mechanism.

The Sharp JY-750 mechanism currently is the only half-height drive available in the 5.25-inch form factor. It offers an average seek time of 40 milliseconds, a sustained data transfer rate of 793 Kbytes per second and burst transfer rates of up to 1.5 Mbytes per second, ClubMac said.

While the drive has a standard formatted capacity of 595 Mbytes, it

can also be configured with a total capacity of 650 Mbytes and a sustained data transfer rate of 870 Mbytes per second.

An external drive is priced at \$2,299. An internal version for the Quadra 900 and 950, Centris 650, and Mac Ixv is \$2,279. Internal models for the Centris 610 and Quadra 800 are planned, although ship dates have not yet been determined.

ClubMac is at 3 Musick, Irvine, Calif. 92718. Phone (714) 768-8130 or (800) 258-2622; fax (714) 768-9354.

## TOOL TAKES PAIN OUT OF SIMM REMOVAL

Suettle — Making it easier for users to upgrade memory, Stratos Innovations has shipped a tool to extract SIMMs from their sockets.

The \$12.99

SIMM Remover is constructed from an anti-static plastic that the company said will not accumulate or discharge static electricity, shielding the circuit boards from electrical damage.

The tool slides over the SIMM, hooks into holes in the card's body and detaches it from all types of sockets.

Several memory distributors, such as PNY Electronics Inc. of Moonachie, N.J., bundle SIMM Remover with their products; it is also available from catalogs such as MacWarehouse or directly from Stratos.

Stratos Innovations is at 2025 First Ave., Market Place Tower PH-8, Seattle, Wash. 98121. Phone (206) 448-1388; fax (206) 448-7830.



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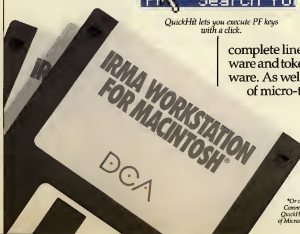
<b>HOST CONNECTION:</b> CUT, DFT, 802.2, TN3270 over TCP/IP.	<b>FILE TRANSFER:</b> DCA® FT/Express™, IRMALINK® FT/TSO and FICMS, IBM IND5FILE.
<b>GATEWAY CLIENT SUPPORT:</b> NetWare for SAA, IRMALAN™/ EFT DCA/Microsoft® Select™ Comm Server,** DEC GAI*** IBM OS/2 EE and PC3270.	<b>API SUPPORT:</b> HLLAPI, Application Development Tool Kit.

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# Traveling Mac users can get teleprompting

## MagicScroll 2.0 runs on PB Duos

By Carolyn Said

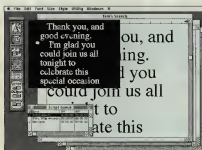
San Francisco—Teleprompting, a technique used by public speakers ranging from TV newscasters to the president, is available to Mac users with a package from Magic Teleprompting Inc.

MagicScroll, which the company recently updated to Version 2.0, scrolls a Mac text file across any NTSC video monitor for easy reading from the podium. It can be set to scroll either automatically at a user-determined speed or by manual control.

Version 2.0 now works on PowerBook Duo equipped with a PowerLink Presenter dock from E-Machines Inc. It adds a Script Queue window, allowing users to link and cycle through several scripts. A new on-screen NTSC window lets the Mac operator see exactly what is being shown on the video monitor.

Other new features include a built-in stopwatch, temporary markers called paper clips, complete margin control, an adjustable on-screen cue arrow and faster text editing.

Like the previous version, MagicScroll 2.0 offers cut, copy and paste of text; permanent, nameable markers called bookmarks; loops; invert (white text on black background); find and find/replace; and multiple open scripts. It works with PostScript and TrueType fonts.



Version 2.0 of the MagicScroll teleprompting software adds a new NTSC display window showing the Mac operator exactly what is on the video monitor.

The program requires an eight-bit display card, Magic Teleprompting said. Compatible cards include Truevision's Inc.'s NuVista and E-Machines' Doublecolor.

MagicScroll previously sold for \$3,500 bundled with an Apple

eight-bit video card. It now sells for \$3,300 for the software only. Upgrades are free.

Magic Teleprompting Inc. is at 1390 Waller St., San Francisco, Calif. 94117. Phone (415) 626-5283; fax (415) 626-2762. □

## XVT-Design++ to bring GUI app-building across platforms

By April Streeher

Boulder, Colo.—Users can build graphical interfaces for applications and port them between the Macintosh, Windows, Unix and OS/2 environments with a set of C++ development tools recently announced from XVT Software Inc.

XVT-Design++ will be available in the second quarter for \$1,395 for Mac or Windows versions and \$3,095 for versions that run on Sun

Microsystems Inc. workstations or IBM Corp. OS/2 systems. The program will allow users to create graphical interfaces on one platform and use them on other supported platforms without writing any code.

XVT-Design++'s feature set is similar to that of the company's XVT-Design, a C development package, but will include object programming necessary for C++ programming and an object-oriented framework that gives users a skeleton from which to build applications.

Other Design++ features are:

► **Interactive tool.** Choosing from menus, developers will be able to create interface objects, such as windows, and specify connections between them.

► **C++ code fragment editor.** Part of the interactive tool, the fragment editor will let developers write C++ code and directly attach it to the graphic object.

► **Portability Toolkit.** For an additional \$1,450, the tool kit will allow the entire application—code and interface—to be ported to a variety of platforms.

XVT is offering users of the XVT++ utility who are covered by a current maintenance program an upgrade to Design++ for \$200. Design++ and the Portability Toolkit can be purchased as a bundle for \$2,195.

XVT Software Inc. is at 4900 Pearl East Circle, Boulder, Colo. 80501. Phone (303) 443-4223; fax (303) 443-0969. □

## NEC offering users the chance to trade in old CD-ROM drives

By April Streeher

Wood Dale, Ill.—Last month NEC Technologies Inc. put a faster spin on its portable CD-ROM reader. This month it is offering users of older NEC players a way to trade up to the portable and other new models.

NEC was the first CD-ROM player vendor to offer two spin speeds in a disc player: 150 Kbytes for audio data and 300 Kbytes for nonaudio data. Called MultiSpin, the technology was included first in the \$615 MultiSpin 84, and since February in NEC's portable \$465 MultiSpin 38. Both players support multisection Kodak Photo CDs.

Through June 30, users of NEC's older Intersect CD-R 48 and CD-R 37 models can pay \$229 and \$179, respectively, and send in

their players. NEC will send back the newer drives.

Aside from the multisection Photo CD capabilities, an upgrade from the CD-R 84 includes a larger cache of 256 Kbytes in the MultiSpin 84, compared with the old model's 64-Kbyte cache.

The upgrade from the portable CD-R 37 to the MultiSpin 38 gives the user the variable spin rate and multisection features; the 64-Kbyte cache stays the same.

Users must shoulder the cost of shipping to NEC. The company said new readers arrive to users in about a week.

NEC Technologies Inc. is a subsidiary of NEC Corp., at 1255 Michael Drive, Wood Dale, Ill. 60191. Phone (708) 860-9500 or (800) 388-8888; fax (708) 860-9263. □



## News BRIEFS

### Toshiba driver upgraded for Photo CD

Irvine, Calif.—Toshiba America Information Systems Inc. this month upgraded its TXM3301 CD-ROM drive to support the Kodak Photo CD format and improve compatibility with new Macs.

A new release of the company's software driver, Version 1.5.2, enables the drive to read single-session Photo CDs. It comes with a new control panel for the 68040-based Quadra and Centris lines.

The driver upgrade is priced at \$15, or free to users who purchased a drive within the past 90 days.

To read multisection Photo CDs, users need both the new driver and a ROM upgrade, which are available together for \$99.

Toshiba America Information Systems Inc.'s DPD Small Parts Department, which is handling the upgrade, is at 9740 Irvine Blvd., P.O. Box 19724, Irvine, Calif. 92713. Phone (714) 583-3129; fax (714) 587-6144.

### RightWriter 5 price reduced to \$49.95

Carmel, Ind.—Que Software last month reduced the price of RightWriter 5, its Mac grammar, style and spelling checker, from \$99.95 to \$49.95.

RightWriter 5 for the Mac checks word processing documents for errors in grammar, style, word usage, structure, capitalization, punctuation and spelling and shows recommended changes. The application can read files created by most common Mac word processors. Que Software, a unit of Paramount Publishing's Prentice Hall Computer Publishing division, also cut the price of the Windows and DOS versions of the program.

Que Software is at 11711 N. College Ave., Carmel, Ind. 46032-5634. Phone (317) 573-2500 or (800) 992-0244; fax (317) 573-2655.

### Fishing for ideas gets more affordable

Irvine, Calif.—In a move aimed at expanding its user base, IdeaFisher Systems Inc. this month dramatically cut the price of its IdeaFisher brainstorming application from \$595 to \$199.

IdeaFisher 2.0, which shipped last year (see MacWEEK, May 5, 1992), helps users generate ideas for strategic planning, research, writing and marketing.

The program includes a database of English words along with 10,000 questions that it selectively poses to help users formulate ideas. The program's plug-in modules, Strategic Planning and Presentation Planning, remain priced at \$99 and \$79, respectively.

IdeaFisher Systems Inc., formerly Fisher Ideo Systems Inc., is at 2222 Martin St., Suite 110, Irvine, Calif. 92715. Phone (714) 474-8111 or (800) 289-4332; fax (714) 757-2896.



# With Apple Products on the Team, MacLinkPlus is the Most Powerful Solution for Mac-PC Data Exchange.

It takes real teamwork to get any job done these days, especially if you're dealing with incompatible Macintosh and PC files. That's why DataViz teamed up with Apple to add even more utility to MacLinkPlus™. It's the most muscle ever assembled to overcome your toughest file translation problems between Macs and PCs.

For years, MacLinkPlus has set the standard for ease of use. And thanks to two new Apple products, what was once easy is now practically effortless. We now include Macintosh PC Exchange™ and Macintosh Easy Open with every package of MacLinkPlus we ship. Macintosh PC Exchange makes DOS disks appear on the Mac desktop and shows their contents as Macintosh files and folders. New Macintosh Easy Open is a System 7™ extension that helps you open Mac or PC files when the application that created them isn't on your Mac. These technologies from Apple teamed with our translators offer the most complete solution to file transfer and translation available in a single package.

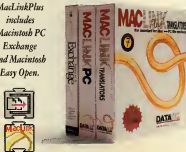
MacLinkPlus contains over 700 conversion paths to and from all popular word processing, spreadsheet, database and graphics applications. Files are converted quickly and easily, with all of their original formatting intact.

In addition to providing you with transfer capability, MacLinkPlus also translates files transferred via other methods. Such as disk mounting utilities like DOS Mounter and AccessPC, MS-DOS emulators such as SoftPC, and network software such as NetWare and LANtastic. Let MacLinkPlus do the work of converting foreign files transferred with these products into the exact format you need. MacLinkPlus/Translators contains the full translator library, Macintosh PC Exchange and Macintosh Easy Open. While MacLinkPlus/PC has all of these, it also allows you to connect a Mac and PC with the included serial cable or via modems.

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## MacFortran compiler goes System 7

By Bruce Wright

Rochester Hills, Mich. — Alsoft Corp. this month shipped an upgrade to its Fortran compiler for the Mac, featuring an improved user-interface code library, code optimization and support for System 7 features.

MacFortran II Version 3.2, priced at \$595,

includes a revised MacFortran Runtime Window environment that automatically creates Mac interfaces for ported programs.

The compiler now includes libraries to help developers create applications that take advantage of System 7 features such as publish and subscribe, aliases, Apple events, and scripting.

Version 3.2 can accept mixed American National Standards Institute and VAX-formatted code and can perform conditional compilation. VAX and Unix compatibility libraries are included to help users develop portable applications. In addition, MacFortran II is compatible with other Alsoft Fortran compilers for SPARC, IBM RS/6000, both DOS- and Unix-based IBM PCs and compatibles, and NeXTStep, among other platforms.

The new version can generate code opti-

mized for 68040 processors. This feature, when combined with the included 68040 math library, can increase application execution speed from 20 percent to 200 percent over 68020- and 68030-based Macs, according to Alsoft.

Current users can upgrade to Version 3.2 for \$149 until May 15. Site licenses, quantity discounts and educational discounts are available.

Alsoft Corp. is at 2751 Bond St., Rochester Hills, Mich. 48309. Phone (313) 853-0050; fax (313) 853-0188. □

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ScreenLink™ lets you control another Mac's screen, keyboard and mouse over a network or via modem. ScreenLink works with both System 6.0.4 and later and System 7. Only SuperSet includes remote access and control capabilities.

Comparison with other Disk Utility Packages					
Product	File Security	File Recovery	File Protection	File Encryption	File Compression
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Norton Utilities	✓	✓	✓	✓	✓
MacTools	✓	✓	✓	✓	✓

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**DATAWATCH**

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## Mac digital-cassette backup system ships

By Kirsten L. Parkinson

Troy, Ohio — Analog & Digital Peripherals Inc. this month shipped the Macintosh models of its One For All digital-cassette backup systems.

Based on a 3.5-inch TEAC streaming tape mechanism, the drives are available in a 160-Mbyte model and a 600-Mbyte model that achieves a capacity of 1.2 Gbytes with on-the-fly hardware compression.

The \$1,295 160-Mbyte drive offers a data transfer rate of 7 Mbytes per minute, while the higher-capacity drive has a data transfer rate of 14 Mbytes per minute.

The drives ship with the company's MacBac backup software and a single digital-cassette tape.

Additional 160-Mbyte tapes are available for \$27 each or \$199.50 for a package of 10. The 600-Mbyte tapes are \$42 each or \$278 for a box of 10 tapes.

One For All models that include both parallel and SCSI ports also are available at the same prices.

Analog & Digital Peripherals Inc. is at P.O. Box 499, Troy, Ohio 45373. Phone (513) 339-2241; fax (513) 339-0070. □

## Compaq drops price of 15-ppm Pagemark

Houston — Compaq Computer Corp. this month dropped the price of its 15-page-per-minute Pagemark laser printer by 20 percent.

The Pagemark 15 now retails for \$3,199, an \$800 reduction from its original list price.

The printer can output tabloid-size pages at a maximum resolution of 800 by 400 dpi and includes Adobe PostScript Level 2 and 43 Type 1 fonts.

The Pagemark 15 comes standard with RS-232 serial and Centronics parallel interfaces; a LocalTalk interface sells for \$229. Ethernet for \$369 and token-ring for \$729. Compaq also offers a PostScript fax option for \$399.

The Pagemark 15, originally introduced in September 1992, is based on a Fuji Xerox engine and includes a 16-MHz AMD 29000 RISC processor running on 4 Mbytes of RAM, which can be expanded to 18 Mbytes (see MacWEEK, Sept. 14, 1992).

Compaq Computer Corp. is at 20555 State Highway 249, Houston, Texas 77070. Phone (713) 370-0670; fax (713) 374-1740. □



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# Gateways

► Networking  
► Communications



## Pathworks update refines controls

Version 1.2 eases  
server configuration

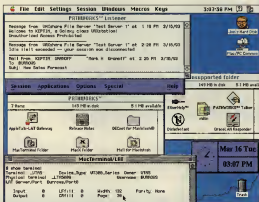
By Nathalie Welch

Litton, Mass. — Digital Equipment Corp. this week will unveil an upgrade to Pathworks for Macintosh that offers several client enhancements and new tools to simplify network configuration.

Pathworks for Macintosh, which integrates Macs into DEC's VAX environment, provides file, print, electronic-mail and database services and lets Mac users communicate with DOS, Windows, OS/2, OpenVMS and Unix users also using Pathworks. The upgrade, Version 1.2, is due next month.

► **Server.** Administrators can configure the appearance of specific file-server volumes and printer queues, so users see relevant services in their local zone.

A new feature limiting the number of connections to a specific volume lets network administrators comply with application licenses that restrict the number of concurrent users. Administrators also can detect and disconnect inactive users from the file server.



Digital Equipment's upgraded Pathworks for Macintosh now offers clients E-mail notification and host status reports via the Pathworks Listener.

Support for the latest version of AFP (AppleTalk Filing Protocol) provides network administrators with more-detailed messages regarding system status and errors. The package also supports AppleTalk tunneling through DECnet wide-area networks, letting users connect to remote AppleTalk LANs over the new DECnet/Open Systems Interconnection

transport for OpenVMS systems.

► **Client.** A new Pathworks Listener application notifies users of new E-mail messages or alerts from the file server. DEC's upgraded MacTerminal 3.1 is included to offer support for viewing wide documents on screen, and new installation procedures make it easier to download the client software from

See Pathworks, Page 18

## Omnis 7 opens to externals, graphics

By Mitch Reifel

Foster City, Calif. — Blyth Software Inc. last week shipped a new version of its cross-platform database application, Omnis 7.

Omnis 7 1.2 includes new support for compiled external commands and large graphics files stored in Omnis and SQL databases. The company said the release also has minor bugs.

Version 1.2 can use external commands that let an Omnis 7 application control a second, custom program running in a window within the Omnis interface. For example, a developer could create a front end that played QuickTime movies or imported PICT files, which users could modify using a custom painting tools provided by an external.

Support for externals may encourage the development of Omnis 7-compatible modules, such as graphing, forms and word processing applications, Blyth said.

Blyth also delivered color graphics support. A new Color Shared-Picture Format lets users store 256-color graphics in Omnis and third-party databases.

Some database-management systems provide limited support for color graphics. So, for instance, an Omnis front end to an Oracle database will support graphics of up to 64 Kbytes in size because that is the largest file supported by Oracle.

Omnis 7 1.2 is \$1,250 for the stand-alone development version; runtime licenses are \$250 and less per user, depending on volume. The network version, Omnis 7 Plus 1.2, is \$2,500; runtime licenses are priced from \$500 to \$125, depending on volume.

Blyth Software Inc. is at 1065 Hillside Blvd., Suite 306, Foster City, Calif. 94404. Phone (415) 571-0222 or (800) 346-6647; fax (415) 571-1132. □

## Tenon cuts price, reconfigures MachTen line

By April Streeter

Santa Barbara, Calif. — Tenon Microsystems Inc. this month announced price reductions, new features, and bundles of its Unix operating system and development tools for the Macintosh.

MachTen Personal 2.1 and MachTen Professional 2.1vm will be available in April for \$495 and \$695, respectively. Personal 2.1 folds together Unix kernel and development tools that had been offered separately. The Professional version includes additional source-code debuggers, the GNU C++ compiler and virtual-memory support. Both City, Calif. versions are based on Berkeley Standard Distribution 4.3 on top

See Tenon, Page 18

## QuickMail 2.6 improves admin, increases reliability of server

By Nathalie Welch

West Des Moines, Iowa — CE Software Inc. this week will ship the long-awaited QuickMail 2.6, and the company will launch a giveaway offer to attract new users.

Server and management improvements make up most of the changes to Version 2.6, which is now priced between \$649 for a 100-user pack and \$749 for a one-user pack.

"They didn't really add anything; they just fixed what was there," said beta-tester Jay Kohn, system manager at Santa Clara, Calif.-based

Clarix Corp. "QuickMail used to be very sensitive to other network activity, but both client and server software are much more stable."

According to CE, QuickMail's server software was rewritten and now has a more reliable architecture.

"With the previous version, we did see some problems with a very small number of mail messages that would just disappear," said Mike Wosner, manager of network administration at Redondo Beach, Calif.-based TRW Inc. "The new server archi-

See QuickMail, Page 18

## Radiant releases sensor to measure electromagnetic fields, report results

By Robert Cohen

San Francisco — Concerned about the invisible electromagnetic fields in your office but frustrated by the difficulty of measuring them? Radiant Enterprises Inc. may help with the release this week of an AppleTalk-based EMP sensor.

CommonSense EMP consists of a base monitoring unit and up to four EMP sensor heads, each of which can be as far as 100 feet from the base unit. The base unit logs EMP data at user-specified intervals and periodically transmits the results to a Mac over an AppleTalk network through a user-supplied LocalTalk connector.

The \$440 base unit comes with a HyperCard stack that can be used to control the sensors and log, plot and export the data.

CommonSense EMP is based on the CommonSense CNX analog-to-digital converters Radiant announced last year.

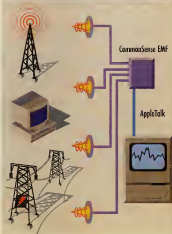
Although the effects of prolonged, office-grade EMP exposure are not yet known, developing a database of employees' exposure over time may help businesses defend them-

selves from liability lawsuits, Radiant said. Handheld EMP-level measurement devices are relatively expensive and, unlike CommonSense EMP, do not provide information about peak field levels, intermittent spikes or cumulative exposure, according to the company.

EMP sensors sell for \$349 in a tabletop/wall-mount version and \$369 in a handheld version.

Radiant Enterprises Inc. is at 1714 Stockton St., San Francisco, Calif. 94133. Phone (415) 296-8040; fax (415) 392-6860. □

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The AsantéHub includes a built-in expansion slot for internetworking option cards. Asanté offers an in-band SNMP hardware module as an option for this slot. The hub also features an RS-232 port for remote dial-up access, and both RJ-45 and RJ-21 connectors for direct-to-

computer or punch-down block connections.

There is also a 3-in-1 "13th" port for interconnecting multiple hubs with backbone cabling. This port includes BNC, RJ-45 and AUI connectors supporting a variety of cabling media.

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# New FDDI component may drive down card prices

By April Streeter

Palo Alto, Calif. — Hewlett-Packard Co. this month announced a fiber-optic transceiver that the company predicts will push down prices for FDDI network cards.

The HFFBR-5104 fiber transceiver, available in the second quarter for less than \$100, is two-thirds smaller and priced about \$50 less than transceivers currently

sold by HP and other vendors.

Vendors are divided on the effect of HP's technology on Fiber Distributed Data Interface (FDDI) adapters for Macs, which now cost between \$2,000 and \$3,000.

"By my estimates it should cost about 20 percent less to manufacture the adapters," said Rod Frazer, vice president of hardware product development at Impulse Technol-

ogy Inc. of Dablonaga, Ga. "With the lower-cost transceivers, it costs less to build adapters and is also cheaper to terminate them."

Frazer added that Impulse plans to release this summer a single-attached FDDI NuBus card using the new transceiver, priced at about \$1,500. Currently, the company's single-attached Spectra NB board is \$2,195.

HP, AT&T Co., Siemens Information Systems Inc. and BT&D Technologies Inc. all have said they will develop low-cost transceivers as well as transmitter-receiver port pairs used on some adapter boards.

Mark Murray, president of Team Advanced Systems Associates of San Diego, which makes a dual-attached FDDI NuBus card that uses transmitter-receiver port pairs, said pair component prices need to reduce further than those now quoted by HP and other vendors before real cost breaks can be passed on to users.

Murray also had reservations about the limited signal range of the new, small-form-factor transceivers. While desktop adapters, including Team ASA's, support FDDI's range of up to one mile between connections, HP's 5104 transceiver will be limited to just 150 meters. HP said it is developing components for release later this summer that will operate in the one-mile range. □

## Retix releases QM gateway to X.400

By Nathalie Welch

Santa Monica, Calif. — Retix this month shipped an X.400 gateway for CE Software Inc.'s QuickMail.

The \$1,795 QuickMail Gateway to X.400 must be used with Retix's DOS, OS/2 or Unix-based OpenServer 400. The gateway lets Mac users of QuickMail exchange electronic mail with local and remote X.400-compatible mail systems, such as IBM Corp.'s PROFS, Digital Equipment Corp.'s ALL-IN-1 and AT&T Mail. The gateway also lets QuickMail talk to LAN-based E-mail systems that have X.400 gateways, such as Lotus Development Corp.'s cc:Mail, Microsoft Mail and Word-Perfect Office.

OpenServer 400 for DOS is priced at about \$5,495, while the OS/2 or Unix version is \$5,950 for a

basic server configuration. QuickMail Gateway to X.400 can reside on the QuickMail server or a different, nondedicated Mac.

The Retix gateway competes with InterCom Systems Corp.'s Dispatcher/MacX.400 for QuickMail, which costs \$1,995 or \$2,995 and requires Apple's MacX.400 SD (Single Domain) or MacX.400 servers, priced at \$2,950 and \$4,950, respectively. WorldTalk Corp.'s \$2,500 WorldTalk X.400 Gateway for QuickMail also is available. The gateway requires WorldTalk's 400 server, priced at \$19,950 for the Hewlett-Packard Co. 9000 platform or \$7,450 for a DOS-based server. Retix is at 2401 Colorado Ave., Santa Monica, Calif. 90404-3563. Phone (310) 828-3400 or (800) 253-2333; fax (310) 828-2255. □

## Tenon

From Page 16

of a Mach 2.5 microkernel.

► **MachTen Personal** runs on any Mac with at least 4 Mbytes of RAM. It will let a Mac user switch between the System 7 Finder and a Unix command-line interface; users will be able to launch Macintosh applications from either environment.

► **MachTen TCP/IP** and AppleTalk networking, FTP (File Transfer Protocol), Unix electronic mail, and Serial Line Internet Protocol. The new version adds token-ring capabilities.

► **MachTen Professional** requires a 68030 or 68040 Mac. Users will receive an array of kernel and development tools for building Unix applications. Professional 2.1m supports Unix virtual memory in the Mac operating system's implementation.

Tenon's Unix system was previously available at \$595 for the kernel and operating system; developer tools sold for an additional \$395.

Tenon InterSystems Inc. is at 1123 Chapala St., Santa Barbara, Calif. 93101. Phone (805) 963-6983; fax (805) 962-8202. □

## QuickMail

From Page 16

texture seems to take care of that."

The new version will be from the file server-based MailCenters used by DOS QuickMail clients. "There are lots of nice new little things like the ability to export and import users and their mail," Wasser said. "As we move people around, it's really a jewel to have." Users of pre-release versions weren't unqualified in their praise of the upgrade, however.

"QM Release still stinks," said David Olson, assistant PC coordinator at Boston-based WGBH Education Foundation. "It's just too feature-laden, and we suggest that people purchase a terminal emulator

or use QuickMail Remote Access."

All standard multi-user packs contain the QM Server, QM Administrator, DOS and Mac client software, several mail gateways, and a five-user version of On Technology Inc.'s Meeting Maker group scheduling program. Upgrades are \$40 per server for users of QuickMail 2.5. Customers with earlier versions pay \$12 per user.

CE Software also announced a promotion that allows users to get free five-user QuickMail packs through resellers. The free package does not include gateways but is upgradeable to the full version and does not have an embedded time limit.

CE Software Inc. is at P.O. Box 65580, 1801 Industrial Circle, West Des Moines, Iowa 50265. Phone (515) 224-1995; fax (515) 224-4534. □



CommPhone software, part of Applied Engineering's AErport mobile communications system, provides screen-based telephone management on the PowerBook.

## AErport manages PB traffic with modem, phone bundle

By Nathalie Welch

Dallas — Applied Engineering is offering a cellular modem and telephone package for all-in-one PowerBooks that can lighten the weight of mobile users' briefcases — and wallets.

The AErport system, priced between \$2,500 and \$3,000, consists of the company's DataLink PB internal fax modem with cellular phone capabilities, DataLink PB CommPhone telephone software, and an internal PCMCIA slot, which replaces the floppy drive.

► **DataLink PB.** The internal modem offers V.32bis, V.14, K4.4 data transmission and V.17, 14.4-Kbps send-and-receive fax.

► **DataLink PB CommPhone.** The software package turns the modem into a voice telephone accessed via an earplug-size speaker-microphone combo, included in the package, or the PowerBook's own microphone and speaker. The software supports phone-

book features including the ability to import and export unlimited entries, auto-dialing, and word-to-number dialing translation.

Digital answering machine features include support for Caller ID and caller codes, the ability to maintain multiple voice mailboxes, and an option to record outgoing messages for specific calls.

► **PCMCIA.** Applied has to remove the PowerBook's internal floppy drive to make room for the AErport components. With the room left over, the company adds a PCMCIA slot, which provides the interface to the now-external floppy drive. Applied plans to release a software upgrade within the year that will enable the slot to read standard PCMCIA cards.

Applied also offers the \$299 Axxel interface to connect the DataLink PB to an external cellular phone.

Applied Engineering is at 3210 Beltline Road, Suite 154, Dallas, Texas 75234. Phone (214) 241-6666; fax (214) 484-1365. □

## Pathworks

From Page 16

volumes on either Ultrix or OpenVMS servers.

"The Listener is a valuable piece when sitting on the VAX end," said Scott Thompson, mainframe systems manager at McDonnell Douglas Corp.'s Aerospace Systems Division in Houston. "I think that they intended to use it primarily for mail notification and DECnet events, but it can be used to communicate the status of the VAX services to those users connected to that server."

A Pathworks for Macintosh license is \$308 per user. Each license upgrade is \$77, but the client software disks and documentation costs \$200. Server software is \$245.

Digital Equipment Corp. is at 30 Porter Road, Littleton, Mass. 01460. Phone (508) 874-3111 or (800) 344-4825; fax (508) 493-8780. □

## Asanté and Dayna match Apple prices

San Francisco — Asanté Technologies Inc. and Dayna Communications Inc. this month dropped prices of the transceivers for Macs with built-in Ethernet.

The thin-net DaynaPORT TRX and 10BASE T DaynaPORT TRX-T transceivers, previously \$129, are now \$99.

Asanté's FriendlyNet adapters, which come in thick, thin and 10BASE-T versions, were reduced from \$125 to \$99.

Asanté Technologies Inc. is at 821 Fox Lane, San Jose, Calif. 95131. Phone (408) 435-8401; fax (408) 432-1117.

Dayna Communications Inc. is at 50 S. Main St., Fifth Floor, Salt Lake City, Utah 84144. Phone (801) 269-7200; fax (801) 269-7363. □

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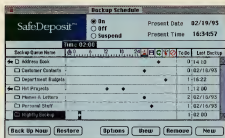
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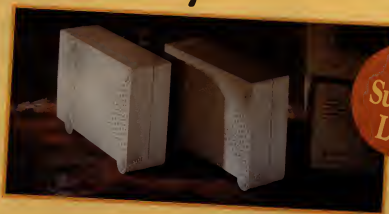
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- ▶ Graphics applications
- ▶ Multimedia



## Graphics users turning to MO drives



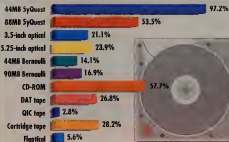
NEWS  
ANALYSIS

By Kirsten L. Perkins  
San Francisco —  
SyQuest vs. magneto-  
optical? It's a question  
that plagues  
desktop publishers  
and service bureaus  
alike, but according  
to industry observers, magneto-  
optical technology eventually will  
come out on top.

Removable-media drives manufactured by SyQuest Technology Inc. of Fremont, Calif., have been the de facto industry standard for several years. In a recent survey by the Association of Imaging Service Bureaus, more than 90 percent of the service bureaus polled owned a SyQuest drive; less than 25 percent owned magneto-optical devices (see chart).

Industry observers say the high price of magneto-optical drives has limited their market success. With a capacity of 128 Mbytes per cartridge, 3.5-inch magneto-optical drives currently cost about \$1,500, while 5.25-inch optical units that hold about 600 Mbytes per cartridge typically cost \$3,000. By contrast, SyQuest 44-

### Storage devices used by service bureaus



Source: Association of Imaging Service Bureaus.

Myte and 88-Myte drives average about \$500 and \$700, respectively.

"I think [magneto-optical drive prices] are going to have to drop substantially before they'll really catch up with the SyQuests," said Robert Geissberger, president of Digital Print Inc., a service bureau in San Carlos, Calif.

Many analysts, however, predict such a price drop in the near future.

"Magneto-optical drive prices are coming down very fast," said Patty Chang, senior industry analyst for Datquest Inc. of San Jose, Calif. "We expect drives under \$500 by the end of the year."

Once drive prices drop, observers said, 3.5-inch magneto-optical technology will have distinct advantages over SyQuest devices for the desktop publishing market, including a smaller form factor, higher capacity and a better price per megabyte. According to Datquest, when users buy seven cartridges, the cost per megabyte for SyQuests is \$1.97, while the optical cost per megabyte is \$1.41.

"In the long run, the 128-Myte opticals are a better buy," said Ed Csech, system applications director for Black Dot Graphics of Crystal Lake, Ill. "If I were in users' shoes, that's what I would go with. If you're getting three times the storage and a

See Drives, Page 24

## Dycam digital camera grabs 24 bits

By Matthew Rothenberg

Chatsworth, Calif. — Dycam Inc. this month will take a shot at electronic color photography with a new 24-bit version of its digital camera.

The Dycam Model 4, which the company will announce this week at CeBIT '93 in Hannover, Germany, is

due to ship in August for \$1,995. The 10-ounce camera captures eight bits each of RGB (red, green, blue) data per pixel and has a maximum image size of 496 by 365 pixels.

The Model 4 runs on a rechargeable NiCad battery that is good for 100 hours with electronic flash or 120 hours without it. Users will be able to capture up to 16 images before downloading them to Mac, Windows or Unix machines via an RS-232 serial interface and cables. A parallel port will be optional.

The device's depth of field ranges from 3 feet to infinity; users will be able to purchase a variety of 24mm close-up, wide-angle and telephoto lenses. The Model 4 includes an independent viewfinder with guides for framing a shot.

Exposure times range from 0.0005 to 0.65 seconds, and the camera features a built-in electronic flash. Audio signals indicate that memory or battery power is low or the camera is ready for the next picture.

The Model 4 will ship with Mac, Windows and Unix software that

See Dycam, Page 24



The Dycam Model 4 can capture up to 16 24-bit-color images that users will be able to download to their CPUs.

## Torqueware lets users process Mac graphics fast on SGI Indigo

By Neil McMonis

Palo Alto, Calif. — Users can get a jump on the PowerPC with new Torque Systems Inc. software that lets Macintoshes tap RISC-based servers that process graphics tasks up to 20 times faster than a Quadra 950.

Torqueware, available now for \$2,000, lets Mac users offload graphics processing to Silicon Graphics Inc.'s Indigo workstations.

In addition, Torque Systems is offering a variety of turnkey software packages, aimed at 3-D artists and pre-press professionals, that use Torqueware to access the Indigo.

▶ **FlashTracer.** This \$2,000 package, developed by Videobits Co. of Pasadena, Calif., speeds 3-D rendering in Strata Inc.'s StratusVision 3d.

▶ **Slave Camera for SGI.** Due later this spring for about \$3,000, this software accelerates rendering in the ElectricImage Animation System from Electric Image Inc. of Pasadena, Calif.

▶ **RipServer.** Due in May, this package will combine CompuLink Inc.'s print spooler and a software-based PostScript RIP (raster image processor) to rasterize images for output devices such as film recorders and imagers.

In addition, this spring Torque will release packages that use the Indigo to accelerate trapping, optical character recognition and PhotoShop filter effects, the company said.

Torque is reselling Indigo workstations equipped with Ethernet and 1.2-Gbyte hard drives starting at \$9,900.

Besides the Indigo, Torqueware and compatible software also work with Integrated Device Technology Inc.'s CZAR, a \$5,995 NuBus board based on a 25-MHz MIPS R3000 RISC chip (see MacWEEK, Jan. 25).

Torqueware requires MacTCP, Apple's TCP/IP communications stack, and an Ethernet interface.

Torque Systems Inc. is at 700 High St., Palo Alto, Calif. Phone (415) 321-1200; fax (415) 321-1298.



Bob Stoeckel of VIZability, an architectural design company in Walnut Creek, Calif., used Torqueware and FlashTracer to render the brick building in less than three hours. Stoeckel estimated the rendering would take 30 hours on a Quadra 950.

## Microtek lightens cost of 4-by-5-inch scanning

Transparency scanner captures 2,000 dpi

By Matthew Rothenberg

Torrance, Calif. — Microtek Lab Inc. next month will release a \$7,999 slide scanner for 4-by-5-inch transparencies.

The ScanMaker 45t scans transparencies ranging from 35mm to 5 by 5 inches at a hardware resolution of 1,000 dpi, which can be increased to 2,000 dpi via software interpolation.

The scanner includes CCD

(charge-coupled device) sensors that can capture 12 bits each of RGB (red, green, blue) or gray-scale data per pixel in a single pass. It features automatic gamma controls that select the best eight bits each of RGB information for the final image, Microtek said.

The ScanMaker 45t can capture an image at maximum size and resolution in as little as five minutes, 20 seconds, the company said.

The scanner will ship with an Adobe Photoshop plug-in that handles landscape or portrait mode, adjusts image resolution in 1 per-

cent increments and scales images from 1 percent to 200 percent.

It also will include a SCSI interface as well as the complete version of Photoshop 2.5, the \$895 image-editing program from Adobe Systems Inc. of Mountain View, Calif.

The new model will compete with 4-by-5-inch transparency scanners such as the \$22,995 Leafscan 45 from Leaf Systems Inc. of Southbury, Mass., which captures 16 bits per pixel at 4,800 dpi.

Microtek Lab Inc. is at 680 Knox St., Torrance, Calif. 90502. Phone (213) 321-2121; fax (213) 538-1193.

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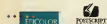
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# Digidesign fine-tunes Pro Tools

By Kristen L. Parkinson

Menlo Park, Calif. — Digidesign Inc. is making overtures to Mac musicians with a medley of new products, including a software upgrade to its Pro Tools digital-audio workstation.

► **Pro Tools 2.0.** The company this month will release a redesign of its Pro Tools software that includes all the features of its Pro Deck and Pro Edit products, as well as several other new sound controls.

Due this month, Version 2.0 will let users switch from recording and mixing to editing by changing windows. Version 1.1.5 users must change applications to begin editing.

The upgrade will let users edit automation and changes in volume, panning and muting that are recorded over time by clicking and dragging on



a waveform. Other new features include instant waveform redraw; improved equalizers; and enhanced scrubbing, the process of moving back and forth along a track to define a sound segment more precisely.

**Pro Tools 2.0** from Digidesign adds instant redraw capabilities that speed the program's performance.

Upgrades are \$49, or free to users who bought Pro Tools after Feb. 1. Prices start at \$5,995 for a four-channel Pro Tools 2.0 system, which comes with an audio interface and a NuBus card.

► **SampleCell II.** Digidesign last week unveiled SampleCell II, a NuBus card for playing back music and sound samples.

The new card costs \$1,995, the same price as the company's original SampleCell card, but it offers support for 32 voices instead of 16 and can accommodate up to 32 Mbytes of RAM.

SampleCell II ships with a limited version of the company's Sound Designer II sample-editing software and three CD-ROM collections of sound samples.

► **Session 8 and 8 XL.** Digidesign last month introduced two lower-priced audio workstations that lack many of the post-production features of Pro Tools. Mac versions of the Session 8 and Session 8 XL will ship by the third quarter for \$3,995 and \$5,995, respectively.

Digidesign Inc. is at 1360 Willow Road, Menlo Park, Calif. 94025. Phone (415) 688-0600 or (800) 333-2137, Ext. 902. □

## VideoLogic board adds QuickTime

By Carolyn Reid

Cambridge, Mass. — VideoLogic Inc. this week will release a hardware and software upgrade that adds support for 24-bit-color video and QuickTime to its full-motion video-production card.

The \$2,195 DVA-4000 handles a 24-bit NuBus display card, a video digitizing card, Version 1.2 of VideoLogic's MIC II software and cabling.

Like the previous version, the new DVA-4000 can capture video signals from NTSC, PAL (European) and RGB (red, green, blue) sources. It can display live real-time (30-frame-per-second) color video in any size window. For \$120, users can buy extra cabling that lets them display video from two sources in two windows simultaneously.

The new hardware will let users

overlay 24-bit-color graphics; the previous version supported overlays of eight-bit-color graphics only.

The updated MIC II software features MIC QuickStep, a new application that will let users capture digitized video as QuickTime movies. MIC II 1.2 also increases the still-image capture rate fivefold and provides a plug-in module that lets users view, freeze, preview and capture video images from within Adobe Photoshop.

VideoLogic cost almost 25 percent of the original eight-bit version of DVA-4000; it is now \$1,495. Software upgrades are free to current users, and eight-bit card owners can upgrade to the 24-bit card for \$999.

VideoLogic Inc. is at 245 First St., Cambridge, Mass. 02142. Phone (617) 494-0530; fax (617) 494-0534. □

## Drives

From Page 22

drive that's twice the price, you're going to spend less on media."

"Probably 30 percent of my clients in the DTP industry are pressuring me to get an optical drive," said Jeff Silva, president of Browne's Blueprint Company Inc. of Sacramento, Calif. "They're frustrated by the size of SyQuest, both the physical size and the storage size."

As a result, industry observers said, the installed base of optical drives will grow tremendously in the next couple of years. Dataquest estimates that 300,000 3.5-inch optical drives will ship this year. In contrast, SyQuest places its installed base at 800,000 drives, according to Dataquest.

To further complicate the issue,

SyQuest is about to release a new 3.5-inch, 105-Mbyte removable drive that it said it will position against optical devices (see Page 10).

SyQuest's advantage is its drives' performance, the company said. For example, the new SyQuest features an average seek time of 14.5 milliseconds, almost three times faster than most of its 3.5-inch optical competitors.

But many users said price, not performance, is the determining factor. "I don't think performance issues are going to be a problem," Digital Prism's Geissberger said. "People are going to look at the cost of [optical] cartridges, and whether it's 10 percent slower or 20 percent slower is not going to be a problem. SyQuest is going to have to counter that." □

## Dycam

From Page 22

provides thumbnail previews of downloaded images and saves them in TIFF, Encapsulated PostScript, PCX, Targa, BMP and JPEG (Joint Photographic Experts Group)-compressed PICT formats.

It will come with a 120-volt DC battery recharger; a 12-volt DC automobile adapter will be optional.

Dycam also manufactures the \$1,095 Dycam Model 3, a mono-chrome model that Logitech Inc. of Fremont, Calif., sells under the name FotoMan (see MacWEEK, Sept. 14, 1992).

Dycam Inc. is at 9588 Tapanga Canyon Blvd., Chatsworth, Calif. 91311. Phone (818) 998-8008; fax (818) 998-7951. □

## GA BRIEFS



### New Digital Zone CD-ROMs feature Photo CD images

Bellevue, Wash. — Looking for the perfect photo for your brochure or presentation? Digital Zone Inc. recently released four CD-ROMs of Kodak Photo CD images that just might fit the bill.

Each \$599 CD-ROM focuses

on the work of one photographer and contains 50 royalty-free photos in 24-bit color.

Every image comes in a variety of resolutions ranging from 128 by 192 pixels to 2,048 by 3,072 pixels.

The discs feature images of exotic locales such as Thailand and Hawaii; industrial settings; people in action; and background textures, including yarn and wood.

The CD-ROMs require a Mac LC or higher, a Photo CD-compatible drive and Eastman Kodak Co.'s Photo CD Access software.

Digital Zone Inc. is at P.O. Box 5562, Bellevue, Wash. 98006. Phone (206) 623-3456 or (800) 538-3113; fax (206) 454-3922.



Each Digital Zone CD-ROM contains 50 images, such as this Kevin Morris photo.

### Users can now Fetch 10-user package

Seattle — Image-database users can now purchase a 10-user package of Aldus Corp.'s Fetch database for cataloging, browsing, and retrieving images and sounds.

The package is \$1,995, nearly one-third off the price of 10 individual packages of Fetch, which cost \$295 each.

The software comes with two sets of documentation and a license to copy Fetch. Through April 30, registered owners of Multi-Ad Services Inc.'s Multi-Ad Search can get a \$99 trade-in by mailing in the title page from their documentation.

Aldus Corp. is at 411 First Ave. S., Seattle, Wash. 98104-2871. Phone (206) 628-2320.

### Wacom bundles Kai's Power Tools with tablets

Vancouver, Wash. — Wacom Technologies Corp. this month began shipping HSC Software's Kai's Power Tools with Wacom's SD line of digitizing tablets.

Kai's Power Tools, which retails for \$149, comprises 33 plugin filters for Adobe Photoshop.

Wacom's SD tablets use pressure-sensitive pens. They range from 6 by 9 inches to 18 by 25 inches and cost between \$695 and \$3,995.

Wacom Technologies Corp. is at 501 S.E. Columbia Shores Blvd., Vancouver, Wash. 98661. Phone (206) 750-8882; fax (206) 750-8924.



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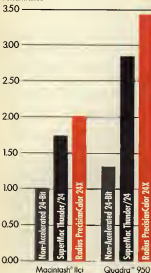
That's surprising, especially since the makers of Thunder/24 want you to pay \$1,250 more for their card.

PrecisionColor 24X isn't just faster and less expensive. It's also available in 7" and 9" versions. So it will fit in all of Apple's newly-announced systems, as well as current models.

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New Media STEVE ROSENTHAL

# Analog color no easy matter

While laundry can easily be "whiter than white" on broadcast television, you can't get an apple to be redder than red. That's why paying attention to the color peculiarities of NTSC-style video can be crucial if you need

an accurate transfer of multimedia graphics from Macintosh to television-style video.

Specifying a color normally is fairly simple on the Mac. Using the RGB (red, green, blue) primary-color model favored by the Color

Picker and other system software, a color is made up of the sum of three primary color values. Equal values of the three give you a tone on the black-to-white axis, while varying the proportions of red, green and blue gives you the full range of displayable hues.

With the right software, you also can work in other color models. Or you can add calibration layers that attempt to match colors on the screen with colors you can print or send out for reproduction. But even with such

software, the underlying Macintosh hardware works in the RGB system.

Unfortunately, TV-style color isn't nearly as straightforward.

In the color system proposed by the National Television System Committee, and now codified as Electronic Industries Association-recommended standard RS-170A, it takes 59 units of green mixed with 30 units of red and 11 units of blue to make colors on the black-white axis. The imbalance gives RS-170A color more room for subtle differences in the green and yellow regions where the human eye is most sensitive. But it also means you don't get a color halfway

Cursor control. After all, that's what a pointing device really is all about. And now, with the introduction of Turbo Mouse<sup>®</sup> 4.0, cursor control takes on a whole new meaning.

Macworld said, "Turbo Mouse 4.0 represents a real breakthrough in trackball software design. If you're shopping for a trackball, Turbo Mouse deserves first consideration."

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# Don't just control your cursor.



another. A real plus for large screen and multiple monitor setups.

And Turbo Mouse 4.0 features Enhanced Mouse Buttons that let you execute one of seven useful commands. You can even have the same button perform different commands in different applications.

Combine all this with OnScreen help, System 7 compatibility, two ADB ports for chaining — not to mention a large comfortable ball with an ultra-responsive feel — and you'll understand why Turbo Mouse has won more awards than any other Macintosh input device in history.

For more information, call 800-535-4242. For information by fax, press 82 and request document 320. Outside the US and Canada, call 415-572-2700.



Paying attention to the color peculiarities of NTSC-style video can be crucial if you need an accurate transfer of media graphics from Mac to television-style video.

between red and green by mixing equal amounts of each color.

Furthermore, some Mac color values just can't be translated. Black-and-white video signals were defined first, and when the time came to shooshorn the color component in the total bandwidth for a video signal, little room was left. In the RS-170A system the three primary-color axes are encoded into only two signal axes, then further limited by total brightness. The resulting "color envelope" includes most of the everyday colors from the natural world, but it does not include a pure brighter red, a deep cyan or the more ethereal purples you see at the edge of the rainbow.

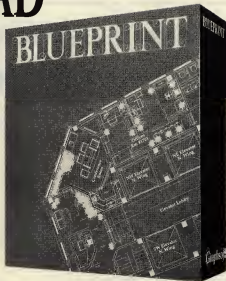
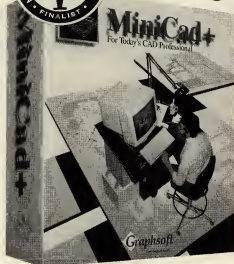
Most recent color graphics programs on the Mac now provide you with optional color palettes that reflect these video limitations. For those that don't, you can make a rough first approximation by toning down any color with a red or blue component greater than 75 percent of the maximum level. If you plan to distribute your work on video, it's well worth investing in a program that provides such a video color set.

By the way, whiter-than-white doesn't really show up on television either. You get whiter-than-white clothes by adding fluorescent materials to detergents to take in invisible ultraviolet light and reflect it back as visible white light. You get whiter-than-white on television by slightly graying out everything but the laundry.

Finally, my apologies for a missed decimal point in my last column. The difference between the RS-170A rate of 29.97 frames per second and the nominal value of 30 fps is 0.1 percent rather than 1 percent. But the overall point remains — as with color differences, even these small discrepancies must be taken into account when programs are transferred over from Mac to standard video. □

Send tips and comments to Steve Rosenthal, c/o MacWEEK, 301 Hecard St., 15th Floor, San Francisco, Calif. 94103; AppleLink: Steve.R; MCI: 114-8611.

# Graphsoft Outruns Claris CAD



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### 3D CAD:

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- ☐ bevels
- ☐ wall-join
- ☐ chamfers
- ☐ dimensioning
- ☐ 9 saved views
- ☐ hatching

### 3D CAD:

none

### Integrated Database/Spreadsheet:

none

### Programmability:

none

## Blueprint 4 \$ 295.00

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# BUSINESS WATCH

## Claris hopes for Windows success

*But narrows product line in the process*

By Lisa Piccirilli

Santa Clara, Calif. — Claris Corp.'s multimillion commitment is forcing the company to narrow its product-line focus while attempting to broaden its user appeal.

The company said it will concentrate on database, graphics and integrated software as part of a three-pronged strategy to strengthen its success on the Mac while gaining a foothold in the Windows market.

Under the plan, Claris over the next six months will stop selling Hollywood, a Windows presentation-graphics program it purchased from IBM Corp. in 1991.

Although Claris will continue to support Claris Hollywood users for one year after discontinuing the program, all marketing, distribution and development rights will be transferred back to the original developer, Publishing Solutions Inc. of Boston, according to Claris.

Claris has also stopped future development of Resolve, its Mac spreadsheet, sources said.

Claris declined to comment.

Two-thirds of the company's strategy is already in place. File-

### Claris does Windows

PRODUCT CATEGORY	MAC	WINDOWS
Flat-file database	FileMaker Pro 2.0	FileMaker Pro 2.0
Word processing	MacWrite Pro	None
Spreadsheet	Resolve 1.1	None
Project management	MacProject Pro	None
Integrated	ClarisWorks 2.0	ClarisWorks (April)
Presentation graphics	None	Hollywood
Drawing	MacDraw Pro 1.5	None
Painting	MacPaint 2.0	None
CAD	Claris CAD 2.0	None

Maker Pro 2.0 is available on both the Mac and Windows. The Windows release, which uses the same engine as the Mac version, has been well-received as Claris' first homegrown Windows development, but it reportedly is not keeping up with its best-selling Mac counterpart, according to industry observers.

In addition, Claris this month released an upgrade to ClarisWorks, the best-selling Mac integrated package. The Windows version of ClarisWorks 1.0 is slated to ship next month.

The final piece of Claris' strategy

is a graphics engine the company has been working on for more than two years. That engine will provide the foundation for a new Mac release of MacDraw Pro as well as a Windows version, due out in the second half of this year.

The vector-based engine, sources said, will support a variety of features not available in the current MacDraw, including new illustration and presentation capabilities. It is also designed to automate many graphics tasks, a feature the company hopes will make its products more appealing to general business users.

Because the engine is written in portable code, it also will help Claris move its graphics applications to RISC-based machines, starting with the PowerPC Macs due next year, sources said. □

## CFP-3: Technology vs. privacy?

By Jeff Uebis

Burlington, Calif. — The computer community's ongoing debate over information access vs. personal privacy took center stage here this month in a dialogue that could shape the Information Age.

The Third Conference on Computers, Freedom and Privacy (CFP-3) provided neutral ground where hackers, cops and computer professionals exchanged radically different views on the social impacts of computing and communications technologies.

"These issues are never going to be solved," said Cliff Stoll, author of "The Cuckoo's Egg," which chronicles his tracking of German hackers through the Internet. "We'll always have this tug of war between anonymity and openness, this tension between community and isolation, between sharing and secrecy."

The most intense debates were

between the law-enforcement community, which fears it will lose its ability to conduct various forms of electronic monitoring, and an alliance between civil libertarians, who think a surveillance society has grown up on telecommunications and computer technologies, and the computer industry, which sees a major market in providing secure communications.

"We have a culture gap between the law-enforcement and computer communities, and unless and until we narrow that gap, we are going to have a religious war," said Lance Hoffman, a professor at George Washington University in Washington, D.C.

The FBI defended its digital-telephony proposal, which would require communications equipment makers and service providers to ensure their

See CFP-3, Page 30

## U.S. cuts tariff on Korean DRAM

By Bruce Wright

Washington — The U.S. Commerce Department last week drastically reduced anti-dumping tariffs against Samsung Electronics Co. Ltd. and other South Korean memory makers.

In a preliminary ruling last October, the department had imposed levies ranging from 6 percent for Hyundai Electronics Co. Ltd. to a staggering 87 percent for Samsung. The Korean manufacturers were ordered to post a bond equal to the tariffs pending a final ruling.

See DRAM, Page 30

- Industry news
- Market trends



## Adobe Systems reports increase in profits, sales for first quarter

By Jon Swartz

Mountain View, Calif. — Bolstered by continuing demand for its PostScript technology, Adobe Systems Inc. reported solid financial results last week.

The software company, based here, posted a 10 percent increase in revenues to \$68.5 million. Net income for its first quarter ended Feb. 26 rose 16 percent to \$15.5 million, or 67 cents per share.

PostScript licensing fees once again paced Adobe's results, increasing 13 percent from the same quarter a year ago and accounting for nearly 60 percent of total sales.

Application sales, by comparison, inched up 5 percent to \$27.9 million. Adobe Photoshop and Illustrator were the company's big sellers, a spokeswoman said.

Strong U.S. sales offset an eco-

nomic slowdown in Japan to lead the surge, she said.

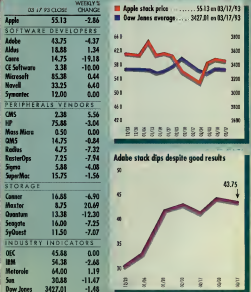
"We continued to see indications of strength in the [licensing] business in the first quarter," Adobe CEO John Warnock said in a prepared statement.

He said several cost-control measures over the past several months—including a hiring freeze as well as the streamlining of the company's sales and marketing divisions—contributed to Adobe's earnings success.

The combination of improved sales and belt tightening resulted in gross margins of 84 percent, up from 82 percent in the same quarter last year, according to the spokeswoman.

"It was a surprisingly good quarter for operating and gross margins," said Bruce Nakaso, Adobe chief financial officer. □

### Stock Watch



Compiled by Nancy International Inc.

Adobe Systems Inc. may have reported an increase in sales and profits for its recently completed quarter, but apparently the results were not good enough for Wall Street investors.

The Mountain View, Calif.-based software developer's stock fell \$2.50 last Wednesday after the results were announced. It closed the week at \$51.75, a decline of 4.8 percent compared with the previous week.

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# Apple loses two execs from PB division

By Andrew Gore

Capertino, Calif. — Apple last week lost two key PowerBook executives. But while one went to head an Apple partner, the other is taking a key role at a competitor.

■ **Nell Selvin**, former director of marketing for Apple's portable computing group, now is president of Global Village Communication Inc. in Mountain View, Calif.

The company claims to have the

largest installed base of Mac models. Selvin said he will help it move from a business model dominated by hardware sales to a more software-oriented model. He added that his background also would help enhance the company's already strong ties with Apple.

■ **John Medina**, previously Apple senior director for portable computing engineering, last week accepted the position of vice presi-

dent of portable products for Dell Computer Corp. in Austin, Texas. Dell currently offers about eight notebooks, but its record in the portable market hasn't matched its success in the desktop PC clone world. Dell said it plans to introduce 18 new portables by year-end.

An Apple spokeswoman said the timing of the departures was "coincidence" and didn't reflect problems in the portable group. □

## DRAM

From Page 28

But last week, after completing its investigation, the department slashed the heaviest tariffs, cutting the levy on Samsung memory to less than 1 percent and a proposed 52.41 percent penalty on Goldstar Electron Co. to 4.97 percent.

The case stems from charges brought last year by Micron Technology Inc. that South Korean chip makers were illegally selling 1- and 4-Mbit RAM chips to U.S. buyers at less than the cost of production (see MacWEEK, Oct. 26, 1992). Boise, Idaho-based Micron is one of two domestic dynamic RAM suppliers.

Parties affected by the case were divided in their response.

"It doesn't appear the government holds the best interests of the semiconductor industry," said Mike Frost, president of RAM distributor Technology Works Inc. of Austin, Texas.

But Keith McDonald, Samsung vice president of sales and marketing, said in a press conference last week that the chip maker was "surprised and disappointed" by the Commerce Department's findings. "We do not believe that the ruling accurately reflects DRAM

sales in the United States," he said.

The preliminary levy caused a brief panic on spot markets last fall. But Samsung covered the bond itself, without raising prices, and McDonald said there was no drop in the supply of 1- and 4-Mbit RAM chips.

Frost contended that supply had indeed decreased for small manufacturers in the past five months but said larger companies that buy memory under long-term contracts were not affected. He estimated chip prices had jumped about 20 percent since October.

However, Sherry Garber, vice president of product services at In-Stat Inc., a research company in Scottsdale, Ariz., said she

hadn't seen an appreciable rise in DRAM prices. Nonetheless, she expressed relief over the government's verdict.

An Apple spokeswoman said the company had not been affected significantly by tariffs on South Korean chips. "Apple sources products globally, so we were prepared to deal with these issues," she said.

The South Korean government had offered a compromise plan that included commitments to widening U.S. manufacturers' access to the Korean market. Apple reportedly was among companies pressing Commerce Department Secretary Ron Brown to accept the Korean plan. □

## CFP-3

From Page 28

equipment could be tapped. "Electronic surveillance provides evidence, and it prevents crimes," said the FBI's Alan McDonald.

But sentiment against the idea was high. David Sobel, legal counsel for Computer Professionals for Social Responsibility in Washington, noted the FBI's reasons for the proposal were secret and criticized it as "drastic" and unjustified. "It's like

saying we should hang gloves because they deprive the FBI of an important investigative technique (fingerprints)," he said.

Last week a federal judge took the civil libertarians' side, ordering the Secret Service to pay \$50,000 to a Texas game publisher whose bulletin board system was seized in a 1990 raid. The judge ruled the government had violated both the federal Electronic Communications Privacy Act and the Privacy Protection Act.

Another major contention topic was computerized medical records, which offer physicians the ability to provide more accurate and responsive care but pose dangers to personal privacy. With health-care reform proposals floating around Washington and up to 20 percent of health-care costs related to information handling, the issue is certain to become more relevant.

Other issues addressed at the conference included electronic democracy, Bell company information services, censorship on computer networks, intellectual property laws, lot fraud, workplace privacy, accessing government information, the economics of privacy, use of the Internet by the CIA (with input from a CIA analyst), and the latest on interactions between the hacker and law-enforcement communities.

The next CFP conference will be held in March 1994 in Chicago. □

## Business BRIEFS



### NeXT president, chief operating officer resigns

Redwood City, Calif. — Peter van Cuylenberg has resigned as president and chief operating officer of NeXT Computer Inc. after only one year with the company.

The departure, coupled with the recent resignations of Chief Financial Officer Marcel Gani and other key executives, casts more doubt on the company's viability after it dropped its hardware business to focus on software and laid off 330 of its 530 employees last month (see MacWEEK, Feb. 15).

Neither van Cuylenberg nor NeXT co-founder Steve Jobs was available for comment last week.

### Intuit raises \$47.6 million in initial public offering

Menlo Park, Calif. — Intuit Inc. raised \$47.6 million in a March 12 initial public offering.

The financial software company's shares opened at \$20 before rising to \$31.75 in the first day of trading. Intuit sold 1.5 million shares of common stock.

According to Intuit, based here, the proceeds will be used for working capital and general corporate purposes. Morgan Stanley & Co. Inc. of New York and Robertson, Stephens & Co. L.P. of San Francisco are managing the deal.

### Virtus gets a little help from Motorola

Cary, N.C. — Virtus Corp., developer of 3-D visualization software for the Mac and Windows, is getting an infusion of capital from one of the giants of the semiconductor and communications industries.

Motorola Inc. has made an equity investment in the privately held company, Virtus announced last week. The amount of the investment was not disclosed. Two executives of Motorola's New Enterprises group will join the Virtus board, which already includes author Tom Clancy, among others.

A Windows version of Virtus' flagship product, Virtus WorkThrough, is slated for release next month.

### Mass Micro sales up, but company still posts loss

Sunnyvale, Calif. — Mass Microsystems Inc. last week reported an increase in annual sales, but profits slid for a second straight year.

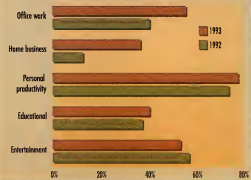
The peripherals maker sold sales for its fiscal 1992 year ended Dec. 31, 1992, were \$23.2 million, compared with \$21.3 million in 1991. Mass Micro lost \$2.8 million, compared with a loss of \$4.5 million last year, chiefly because of restructuring costs and the closure of its HyperPro Inc. subsidiary.

Company President Carl Pompei said Mass Micro's pending merger with Romtek Corp. should boost storage sales (see MacWEEK, Jan. 4).

## MacWEEK index

### USE OF HOME PERSONAL COMPUTERS

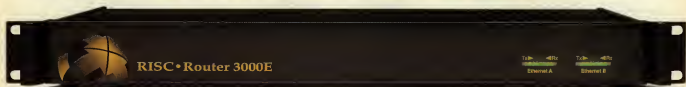
U.S. personal computer users will spend more time working and less time playing at home in 1993 than they did last year, according to a recent survey.



Source: Software Publishers Association.



# Give your network a future.



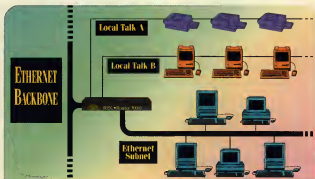
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*RISC Router 3000E creates an Ethernet subnet. This makes both the subnet and the backbone faster. It also creates a "firewall" which isolates each of the networks from problems on the other.*



*Route between two Ethernets and two LocalTalks for about the same cost as a GatorBox or a FastPath.*

**Q:** Does the RISC Router 3000E support the standard set of features I've been using on my Ethernet-to-LocalTalk routers?

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LETTERS



## Unresponsive AESC dealers were no day at the beach

Regarding the letter "Apple exacts its own sacrifice from longtime ed dealers" (MacWEEK, March 1) I'm so glad "Name withheld by request" took his role as an Apple Education Sales Consultant (AESC) seriously and developed excellent relationships with his clients. But before he makes statements such as "Bile was tasted from coast to coast..." about Apple's changing approach to the education market, he should look a little further than his own situation.

When I started consulting for Mac users in 1991, I dutifully referred all local educators who asked me about buying Macs to the local AESC. It didn't take long for me to see an emerging pattern. In the 18 months since then, I have heard many groans, moans and tales of woe regarding this territorial setup that forces a school to deal with the local AESC, no matter how unresponsive it is. When it takes three or four phone calls just to get a price for an LC, something is wrong. When educators have to drive 60 miles each way to get the training the AESC is supposed to provide, or even if they don't want the training and they still have to drive the 60 miles to sign off, something is wrong.

If most of Apple's academic customers were happy under the old plan, I'm sure they will continue to seek support from their former AESCs. That remains a viable option. But for those areas such as ours where AESC support has been minimal to nonexistent, this new plan takes the shudders off both the educators and the consultants who are truly excited about Macintosh technology. I no longer have to walk on eggs when the academic community approaches me for the support it is due, and that is a most gratifying prospect.

Matthew Sivang  
Antargraph Systems  
Manfield, Pa.

## Fault-tolerant compression has better file-recovery odds

Raymond Lau's letter "Stuffit creator disputes safety of file-compression products" (MacWEEK, Feb. 1) does a disservice to MacWEEK's readers. Clearly, Lau's concept of "modern compression schemes" includes Aladdin Systems Inc.'s Stuffit Deluxe. While these "modern" schemes suffer from the problem he described, Fifth Generation Systems Inc.'s AutoDoublerr certainly does not.

Lau stated, "In any modern compression scheme, redundancy is reduced to such a point that a small amount of damage (anywhere from a single bit to a few bytes) is likely to render the remainder of the compressed file badly damaged." We assume he's



correct—with regards to Stuffit Deluxe. However, AutoDoublerr's design minimizes this problem. In AutoDoublerr, we "block" a file so that damage to any portion doesn't propagate throughout the file. AutoDoublerr's blocks are 8 Kbytes apiece. Therefore, assuming random damage at one point within a block, only 4 Kbytes on average would be lost, not the whole file. This means a substantial portion of the file is recoverable.

The pictures above illustrate AutoDoublerr's fault tolerance. Graphic 1 shows the original Adobe Photoshop file. Graphic 2 shows the file after it was compressed, deliberately damaged in four places and then recovered using AutoDoublerr's recovery program. Note how AutoDoublerr limited the damage to four small blocks. Graphic 3 shows what happens with a conventional compressor as described by Lau.

In our Sophos "Myths about compression need to be cleared up" (MacWEEK, Jan. 4), we also stated, "Since fewer blocks are used to store a compressed file, the chance that the file is stored over a bad block is reduced." We stand by this statement. If a random disk error occurs, it is half as likely to affect a file that is half the size.

Compressed or not, any damage, however insignificant, can make some files unusable. The difference is that with a compressed file you can determine the file is damaged vs. just having your application crash unexpectedly.

We agree with Lau that data compression is a reliable technology. However, disks can do crash, and fault-tolerant compression gives you a much better chance of recovering a damaged compressed file. As far as we know, AutoDoublerr is the only program to offer this capability.

Lloyd Chambers, director of compression development, and Terry Morse, director of compression marketing,  
Fifth Generation Systems Inc.  
Palo Alto, Calif.

Send letters to MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MC1 323-1203; Internet, letter@macweek.ziff.com; fax (415) 243-3650. Include your name, address and phone number. Letters should not exceed 300 words. We reserve the right to edit for clarity and length.

## The Mac Manager

## Database Mac doesn't deserve to be dismissed

When you audit the Macs in your shop, what sorts of applications do you find most in use? Word processors? Spreadsheet? Maybe presentation software?

In each category, how are these packages being used? Is it mostly for basic clerical and administrative chores, or is it perhaps for higher-profile, more-analytical functions? If you conduct this exercise as I have with some of my clients, the results likely will reveal that database is a category of software that lags both in frequency and sophistication of use. You'll probably find flat-file databases employed for some basic record keeping, while you also might have a custom relational application running that ties your department into some corner of the corporate data farm for some limited retrieval.

In both instances, the potential of database software and database solutions has barely been scratched, and that's a waste that all Mac managers need to start addressing now.

Our Mac-using charges need to become as proficient at designing database models for reporting and analysis as they have become at designing word processing documents, spreadsheet templates and presentations.

**The Mac as database hero.** The Mac is a seriously undermanned database platform, which may be one reason why we don't expect more database usage from it. That perception has changed a bit over the past year with the release of industry-leading products such as Claris Corp.'s FileMaker Pro 2.0 and ACI US Inc.'s 4th Dimension 3.0.1, but the perception of the Mac's database prowess still seriously lags behind the reality.

The truth is that the Mac blows away other platforms for sheer suitability for

database applications, thanks to its mature graphical user interface,

random access methods for system resources, open and versatile architecture, and advanced connectivity options. But the perception that the Mac is a database weakling lingers because the platform never solidly embraced xBASE, the now-tarnished DOS database standard.

Unfortunately, Apple has focused only on the connectivity power side of the database issue. As a result, the Mac often is thought of only as a client to someone's server. This only perpetuates the nonsense about the Mac being "too cute or too graphics-oriented" to "crunch databases."

It's time for Apple to remind everyone that the Mac hardware can blow through data with the best of the Intel-based alternatives. This week's server introductions, including the Oracle-based database server, should end speculation about the Mac's relative suitability for heavy-duty mainstream database applications.

**Say amen somebody.** OK, let's say that Apple helps us after the image problem, and we do our best to leave our database and platform prejudices at the door. Then what?

We have to make our commitment to start proselytizing databases and database tools among our colleagues. We have to show that our Mac workers can jump levels in productivity and performance if they are taught how to manage complex data with sophisticated database tools.

And finally, we have to sit down ourselves and get serious about what we should expect from today's best Mac databases. It's more than we're attempting now. □



DON CRABBE



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# PowerPC: What to expect



Anticipation of Apple's upcoming PowerPC Macs has sparked more excitement and more misinformation than any product launch in Apple's history. With vastly different hardware at its center, the PowerPC-based Mac has the potential for tremendous horsepower. The Mac's move to RISC represents as significant a change as the move in home audio from vinyl records to CDs. Speculation on the new machines has left many users confused and uncertain about the capabilities of the PowerPC chips and the future of the current Mac line. In this Special Report, we take a look at what developers, users and managers can expect from Apple's new machines.

## RISC will put Mac on a new foundation

By Henry Morr

*Apple's  
PowerPC  
machines*

*will be  
very much*

*Macs —  
'not some  
Granny  
Smith kind  
of computer.'*

Jan. 24, 1994, will mark the Mac's 10th birthday. With luck, it also will mark the beginning of a new era for Apple, its developers and its customers.

On that Monday, barring a serious slip in the development process, the company will introduce its possibly even ship a new Mac model unlike any other built in the platform's first decade. Instead of a 68040 processor, the new system's CPU will be a PowerPC 601, the new RISC microprocessor developed jointly by IBM Corp., Motorola Inc. and Apple.

But for all its uniqueness, that new machine will be very much a Mac — "not some Granny Smith kind of computer," in the words of Kirk Lovgren, vice president of Apple's Developer Group. The machine will be running System 7 — partly in emulation, partly in ported form — and existing Mac programs should run without modification, Apple officials insist.

New software will, of course, be required to take full advantage of the processor, which experts said offers more than twice the power of a 68040. But — contrary to some widespread misperceptions — Mac users moving to RISC won't have to contend with PowerOpen, Apple's new Unix implementation, much less with Taligent Inc.'s upcoming object-oriented operating system.

The PowerPC-based Mac due at the beginning of next year will be the first of many. A second 601 machine, due in the summer of 1994, should take Mac performance to new peaks. A variety of other RISC Macs, ranging from notebooks and low-cost, entry-level systems to high-end, multiprocessing workstations and servers, will follow in late 1994 and 1995, as other implementations of the PowerPC architecture arrive.

Indeed, within three years the entire Mac line could be running on RISC.

**Dilemmas and opportunities.** For Apple the shift poses a difficult marketing challenge: how to keep customers buying 68040 systems during the transition.

But over the longer haul, company officials believe, PowerPC processors will give Apple a significant competitive advantage in the markets of the mid-'90s: a superior price-performance ratio when compared with systems based on Intel 486, Pentium and P-6 processors (see story, Page 41).

For developers the new processor means both opportunity and burden. It promises unprecedented horsepower, and companies that move quickly to take advantage of it in imaginative ways stand to reap rich rewards.

But most Mac developers are already straining to keep up with Apple's other system-software innovations, and moving to a new processor means having to master

### Inside

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## Apple not the only player in the PowerPC market

Apple is likely to be the largest customer for the PowerPC processor, but it won't be alone in using the new chip.

IBM Corp., Apple's alliance partner and the original developer of the Power architecture, shows no sign of abandoning the industry-standard Intel x86 architecture in its mainstream personal computers.

But Big Blue's Advanced Workstations and Systems Division has announced plans to use the PowerPC in several ways, including upgrading the RISC System/6000 POWERstation 220, its low-end workstation, to the PowerPC 601. The company also will market a 601-based "notebook workstation" to be built by Tadpole Technology Inc., an Austin, Texas, and Cambridge,

England, company that builds SPARC laptops.

The IBM workstations, expected by early next year, will come with a new PowerOpen version of AIX, the company's implementation of Unix. It will include an Apple software product called Macintosh Application Services, which will let users run off-the-shelf Mac applications, including current programs written for the 680x0, alongside character-based, X Window and Motif Unix applications.

The PowerPC and PowerOpen are also available to other system makers, but so far the only takers have been a handful of companies making advanced, mainly defense-related workstations: Groupe Bull, Thomson-CSF and Harris Corp. — By Henry Narr

new tools and techniques — all for a market that for several years to come will be minuscule compared with the installed base of 680x0 Macs or Intel-Microsoft machines.

For Mac managers and users the dilemmas are less immediate. Savvy buyers know better than to defer needed hardware purchases because there's something better over the horizon (see story, right). But as PowerPC Macs get closer, the prospect will add a new and unknown variable to the already complicated calculus that choosing a Mac model requires.

**PowerPC hardware.** The first PowerPC Mac will reflect Apple's focus on broad-based, high-volume markets. It won't be a barn-burner by RISC standards, but it should deliver "better-than-Quadrax performance at near LC prices," sources said.

The first PowerPC Mac, according to sources, is likely to incorporate a version of the chip running at at least 50 MHz, 4 or 8 Mbytes of RAM, a 2.8-Mbyte floppy drive, and built-in support for 16-bit color on screens up to 16 inches in size, sources said. It reportedly will have a processor direct slot or no expansion bus. Like the 68040-based Cyclone and Tempest Macs expected this summer, it will feature a new high-performance I/O subsystem.

Specs for the second PowerPC model are less clear, but current plans reportedly call for a system that will deliver three or four times Quadrax performance at a street price of about \$3,500. It is expected to use a faster version of the PowerPC 601 and include a new high-speed expansion bus. Company engineers reportedly have been weighing several bus designs, including Apple's QuickRing technology and Intel Corp.'s Peripheral Component Interconnect specification.

**System 7, one way or another.** Perhaps because the PowerPC project, as part of the Apple-IBM alliance, was announced

at the same time as the PowerOpen version of Unix and the Think (now Telligent) object-oriented operating system, considerable confusion has surrounded the question of system software for the RISC Macs.

In fact, Apple planned all along to deliver a version of the standard Mac operating system for the new machines. The challenge is that much of the hundreds of thousands of lines of code that make up the Mac system software and firmware were crafted in 680x0 assembly language to take maximum advantage of that processor, and porting such code is a massive task — one that will be far from complete when the first PowerPC Mac ships.

To solve that problem Apple has developed an emulator that enables the new machines to run 680x0 code by mapping the 68020 instruction set to corresponding PowerPC instructions. Using the same emulation technology, existing third-party software written for 680x0 Macs — including not just applications but also most utilities and extensions — should run on the PowerPC Macs.

**Speeding emulation.** The new chip has enough raw power to deliver approximately 10x performance in emulation mode, according to Apple officials. To get beyond that level, the company is attempting to port selected system components — those that offer the most "bang for the buck" — to PowerPC native mode.

This approach is based on research showing that applications typically spend more time executing Mac OS Toolbox and system routines than their own code (see MacWEEK, March 16, 1992). Aldus PageMaker, for example, spends 88 percent of its time executing Toolbox and system routines, and just three routines account for more than half of that time, according to Apple.

Thus, getting even a small proportion of the operating system running

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# Managers say they will not wait for the arrival of PowerPC Macs

By Jim Leake

Given the current technology available to them, managers are saying the wait is not worth the RISC.

As they await dramatically improved price-performance ratios from RISC-based Macs, Macintosh managers already are thinking about incorporating PowerPCs into their organizations.

But RISC technology is still a year away from the Mac market, they say, and replete with unanswered questions. Most managers, therefore, see little benefit in deferring any planned purchases of existing hardware.

**Can't wait.** Toby Roberts, editorial director for the Chicago Sun-Times, plans to buy two Quadra 950s by June. "Since I've got approval, I'm going to spend it now. I can't wait a year," he said. Many other Mac managers share his view.

"As we get close to products we can actually buy, we might defer [purchases]," said Thomas Unkefer, director of technology management for I.T.V. Steel Inc. of Cleveland. "But I think it's real early right now."

Apple evidently agrees. "As far as recommended buying strategies, we think you should buy the right computer for your use right now," an Apple representative said. 680x0 Macs "are still going to be the base system for a little while yet," according to an official at Apple's Enterprise Systems Division, which is in charge of servers and networking.

With the first PowerPC Macs not expected until early 1994, most managers said it is too far ahead to change buying plans. "When peo-

ple will put the brakes on will be the third and fourth quarter," said Bill Whitley, president of the Whitley Group of Charlotte, N.C. He said that when planning computer purchases, much depends on the momentum of your business. "When you're going full steam, there's no way you can hold off and not buy what you need."

**PowerPC buying issues.** According to managers, several issues should be kept in mind when deciding whether to wait for the RISC machines.

► When will the PowerPC machines really be available? Prospective release dates tend to slip back when truly new technology is coming out. Counting on announced products to ship on time is a gamble; deferring purchases in anticipation of announced machines, whose specs, prices and schedules are still in flux, could prove downright foolhardy.

► What is the cost of not acting now, as well as the cost of the hardware? Passing on upgrades to more powerful existing Macs, such as Apple's new 68040-based models, could mean missing out on significant product enhancements for a year or more.

► What will the PowerPC do for you? Specifically, what do the enhanced capabilities mean to your company's business?

"You always hesitate to jump on any bandwagon. The installed base

See Managers, next page



Thomas Unkefer, director of technology management for I.T.V. Steel, believes that the entire market will be RISC-based in the next few years, but the difficult question is which operating system will come out ahead.

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in native mode on the PowerPC could give a substantial lift to the performance of applications in emulation. "We're targeting the perceived performance of a 25-MHz '040," said Jordan Mattson, Apple product marketing manager for PowerPC tools; other officials said Mac IIfx performance is a more realistic target.

The mixed mode architecture imposes substantial overhead for checking and routing each trap, and progress in porting key routines has been slow, sources said. But Apple engineers reportedly intend to get at least the most critical Toolbox routines and managers ported to native PowerPC mode in time for the release. In any case, QuickDraw will definitely be running in native PowerPC mode, sources said, and that alone will give emulated applications a significant boost.

**Native applications.** The outcome of Apple's porting project could shape initial market reaction to the PowerPC Macs since most

applications will have to run in emulation at the outset.

A more important long-run factor, however, is how fast third-party developers bring out applications that run entirely in native mode and thus take full advantage of the PowerPC's speed.

It's still too early to estimate how many such programs will be available at the launch of the first RISC Macs and how quickly others will follow. For now development tools are limited, but Apple has promised a new C/C++ compiler and sponsored Echo Logic Inc.'s FlashPort binary-conversion technology.

To ease the transition, the company also is developing a new "fat binary" format, which will let developers include native PowerPC code in the same versions of their programs that run on 68000 Macs. The RISC code will go into the application's data fork, while the resource fork will continue to hold 68000 code and resources. Mattson said Apple will upgrade its Installer so it will be able to install only the 68000 code, only the PowerPC code or both. □

## Managers

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and compatibility with standards means a lot," said Tony Buttrum, president of Advanced Computer Graphics Inc. of Cincinnati. "I don't think a lot of people want to retool and put off a lot of things. I'd question them if they did."

Still, Buttrum said, his sales legitimize reasons for waiting on the RISC machines. "For people whose productivity is going to be greatly increased by the new technology, then, yes, I think you have to consider waiting [for the PowerPC]."

**Cautious about Apple.** "I'm afraid that having seen the way Apple works for us right now, I'd really have to see something [of the PowerPC Macs] before I'd buy anything," said Michael Taylor, director of technical services for Ednet Inc., a Chicago video production company that already uses Macs extensively, together with high-end, RISC-based workstations.

"I know what problems I've had with a Quadra," Taylor said. "First we couldn't get one. Then when we got one, a lot of our software wouldn't run on it."

Apple, Taylor concludes, has "no track history in that technology. So what makes them think I'll be excited? It's too early."

LTV's Unkefer said the steel company, which has about 400 Macs, has been watching the RISC development scenario carefully.

"We're inclined to think that some time in '94 or later, the entire market will be RISC-based. We intend to go to that direction."

## OS and application concerns

The difficult question, Unkefer said, concerns operating systems, "since the [future] direction seems to be all operating systems running on those RISC chips. The question then is to pick the winning operating system."

A version of System 7 will operate on the PowerPC Macs, and Apple has introduced additional uncertainty by promising two other operating systems—PowerOpen and Taligent for the PowerPC (see story, Page 39).

"Apple has no track history in [RISC] technology. What makes them think I'll be excited?"

— Michael Taylor

If anything slows down a purchasing decision, Unkefer said, it's not knowing whether "you're headed in the right direction."

Another purchasing factor lies in deciding which applications are appropriate for a RISC machine.

Chris Pedersen, technical animator for an aerospace company and owner of CheapShot Graphics of Huntington Beach, Calif., said he believes that many high-end users will tap the RISC chip's higher power and performance but that many average users won't.

"For graphics and animation, the PowerPC is really going to change the story. If you are sitting for hours or days waiting for your animation to come out, you are going to want to use RISC," he said. "If you are doing only Excel spreadsheets or are not pushing past Quadra [performance levels], then you won't need RISC."

Marvin Berns, producer and co-owner of Markey Enterprises, a Toronto video-production company, agreed. "People are going to be happy with what they've got, which they aren't pointing to full capacity."

He also pointed out that the first PowerPC Macs will be low-end machines. Midrange and high-end PowerPC Macs are not expected until late 1994 and 1995. "At the Quadra level, where I'm at, I assume they won't be available for another year [after that]," Berns said.

Pedersen said he thinks RISC add-in boards will hit the Mac market within months, an interim solution until the PowerPCs ship. "If I can pop in one or more RISC boards, then that definitely is what I will do," he said. "And I think other people will do the same."

Like many others, Pedersen recommends going ahead with Mac purchases, with an eye toward the PowerPCs on the horizon. "I don't think Apple is foolish enough to come out with a RISC machine to make all the other machines obsolete," he said. "The purchase you make today will not be a dead-end machine, as long as you go for a reasonably high-end Mac." □

## Forces gather for PowerPC roundtable

The development of the PowerPC is centered on Austin, Texas, facility called the Somerset Design Center. The building is named after the site in Arthurian legend where warring

forces put aside their swords, and members of the three teams that staff the building say the spirit that inspired the name has been a key factor in the project's success thus far.



Members of Apple's Somerset delegation (left to right): Peter Vaddstad, Rich Weeks, Bill Goins and Paul Nixan. (Not pictured, Glenn Kring, Glenn Kring, and Tim Olson)

Only eight of the more than 300 people employed on the project came from Apple; the others are drawn in about equal numbers from Apple's two partners in the project, IBM Corp. and Motorola Inc. Bill Goins, Apple's original product manager for the Mac ILC, said he's been pleasantly surprised by how well the team has gelled. "The IBM people have been the big surprise," he said.

Paul Nixan (right), chief of the Apple delegation, said, "We're a minority from a numbers point of view, but we're not treated that way. Sure, there are tough meetings where people end up yelling at each other, but it's over technical issues—cost, time to market, things like that—and not company lines."



"Part of the culture here is not to have an IBM or Motorola or Apple culture, but to have our own," said Motorola's Russell Stangphill, co-director of the center along with IBM's Tom Whiteside. According to Stangphill (left),

Somerset finished 1992 with all goals met, not only for the first PowerPC, the 601, but also three second-generation versions. The 603 is due at the end of this year, the 604 in the first quarter of next year and the 620 in mid-1994. "That means we're a year into a two-year design cycle, and we're still on time," he said. "In this business, that's a miracle."



# What's next for Mac OS?

By Bob Weibel

Will Apple's  
OS strategies  
for PowerPC  
Macs breed  
contentment?

**S**ometime in 1994, PowerPC-based Macs will gleam from dealer shelves alongside the Macs you know and love. But will the PowerPC Macs really be Macs? The short answer is yes. Apple knows that the Mac operating system and interface, not the underlying silicon, make a computer a Macintosh.

Consequently, the company is making sure the Mac operating system, with its trusty Trash can and other features, will beam from PowerPC Macs on Day One of their launch. Still, with PowerPC Macs around the corner, users and developers ponder what's in store.

Rick Rasmussen, vice president of C-Cube Microsystems of Milpitas, Calif., said he welcomes the entrance of high-power RISC processing to Apple's CPU line. "People are most concerned about the Mac interface," Rasmussen said, "and fewer care about what's inside the computer itself."

Rasmussen said that if Apple does a good job in porting the Toolbox, Finder and other aspects of the current Motorola 68000-based Mac OS to the PowerPC Mac, everyone will appreciate the higher horsepower.

"But if Apple should switch over to a completely different operating system style, a la Unix, for example, then it will have done itself a great disservice," he said.

Fortunately, Apple's approach to operating systems for the PowerPC Mac will stress the compatibility and continuity that Rasmussen and most developers see as vital.

Jordan Mattoon, Apple product marketing manager for PowerPC tools, recently reassured attendees of the Apple developers conference held at Macworld Expo in San Francisco that the Macintosh soul is not in peril. "Everyone should understand that PowerPC Macintoshes will be Macs," Mattoon said. "They'll look like Macs and act like Macs and be Macs in every sense of the word."

**The more things change...**  
It's natural that many people saw Apple's alliance with former adversary IBM Corp. as an ominous portent for the independent future of the Macintosh. The sight of Apple and IBM did executives griping and grinning on national television wasn't nearly as confusing as their vow to bring the Mac and IBM desktop computers into the 21st century with shared technology such as PowerPC chips, PowerOpen

Unix, and new operating software from Taligent Inc. and Kaleida Labs Inc. Present and future shock aside, that's a lot to digest.

Apple's been taking pains to clear up the confusion. Apple's Mattoon reminded developers that the mainstream PowerPC OS will be a version of the current Macintosh operating system, with the same interface but retooled on the inside to run on the new PowerPC architecture.

For compatibility, the PowerPC Mac OS will emulate the current 68000-based Mac OS, so you'll be able to run the Mac software you now use. However, since the emulation itself requires a lot of additional processing, applications running in emulation on the PowerPC Mac won't be nearly as fast as applications written or converted to run directly for the PowerPC RISC chips.

PowerOpen and Taligent will be two additional PowerPC Macintosh operating systems, but they're in no way fundamental to the launch of PowerPC Macintosh. PowerOpen will be to the mainstream PowerPC Mac OS what A/UX is to today's Macs, a separate operating system option for those whose work requires Unix (see story, right).

Taligent is a long-term development effort that won't have mainstream Mac implications for some time. In fact, Apple fears that speculation over the role of this futuristic object-oriented operating system is distracting developers from the developmental tasks at hand. For that reason Apple has been deemphasizing Taligent in public.

**Going native.** With Apple promising us Macintosh heaven for the new PowerPC Macs, the next issue becomes one of features and performance.

Brad Burnham, president of Echo Logic Inc. of Holmdel, N.J., has been careful though to Apple's PowerPC software strategy.

"Apple is going to support 68000 emulation on PowerPC because it recognizes that to introduce a new architecture to the world today you have to bring the application base forward," Burnham said. "It's also going to support a native PowerPC development environment because it recognizes that the same applications running slower is not going to sell a hot new machine."

Echo Logic is making ready a PowerPC software development tool known as FlashPort, which con-

verts executable 68000 Mac programs into PowerPC Mac programs. FlashPort may be one trump card helping to ensure market success for the PowerPC Macs because it will provide a way around a Catch-22 predicament that's crippled other promising new platforms: achieving a critical mass of software.

The problem is that because the initial base of PowerPC Macs will be small, software developers may be reluctant to invest the resources required to port their products to run in native mode on the new machines. But if most software runs only in 68000 emulation mode, with its relatively slow performance, customers won't see an advantage in moving to the RISC machine, and sales will suffer, thus making development all the more reluctant to port, and so on, in a vicious circle.

FlashPort changes the calculus, Burnham said, because it makes it possible for developers to convert existing products to run on PowerPC Macs at nearly the performance levels of fully native applications, at a fraction of the development cost.

Apple, in fact, has promised that the programming interface for the PowerPC Mac OS will match closely that of System 7 on current Macs. That will make it easier for developers to build both 68000- and PowerPC-based applications at the same time.

**Not just a faster machine.**  
According to sources at Apple, the company's marketing strategy is based on the idea that you won't buy into PowerPC performance just to run your existing applications faster.

Guy McCarthy, president of Language Systems Corp. of Herndon, Va., developer of a Pascal compiler for PowerPC Mac OS, said that Apple has suggested the PowerPC will perform today's tasks

faster, but at the same time it will do other things beyond the reach of the current crop of Macs.

"I believe Apple intends the extra RISC horsepower to be used for things like speech processing, even digital video processing," McCarthy said. Nothing is nailed down yet, but Apple's Mattoon said the RISC-based performance will indeed allow Apple to extend the Mac interface in ways McCarthy suggests, and more.

**History repeats.** McCarthy pointed out that Apple's strategy has a historical precedent. About four years ago, Sun Microsystems Inc. moved from a Motorola 68000-based architecture to a type of RISC architecture it dubbed SPARC.

Sun kept its same operating system and user interface and consequently lost none of its customer base. In fact, driven by SPARC's higher performance, the move almost quadrupled Sun's installed base, according to McCarthy.

For Apple, the PowerPC Mac operating system development is a daunting technical task, given the complexity of the Mac OS and the fundamental differences between the PowerPC and Mac's 68000 processors. Still, no one we've spoken to doubts Apple can pull it off.

However, despite assurances of compatibility, some Apple executives may lie awake at night wondering whether the performance and feature advantages of PowerPC will motivate droves of Mac owners — many of whom haven't yet migrated to System 7 — to face another OS transition.

Apple is moving to RISC, and the Mac OS with it; the question is how long Apple's product line will straddle the old and the new. In this, your checkbook may have the last word. □

## Understanding the 'power' in PowerOpen

PowerOpen will be the operating system for PowerPC Mac owners who need to run Unix-based applications. However, the "power" in the name does not mean that PowerOpen will be the mainstream OS for PowerPC Macs, any more than A/UX is today.

When the ink dried on the Apple-IBM Corp. agreements in October 1991, IBM had agreed to provide Apple with an upcoming version of AIX, IBM's Unix implementation. In return, Apple agreed to provide IBM with the technology needed to allow standard Macintosh applications — starting with the Finder — to run under the new AIX, much as they do under A/UX today.

Apple will apply the PowerOpen label to the new version of A/UX that results from the deal; IBM will do likewise with the new AIX.

The "open" in PowerOpen derives mainly from the Open Software Foundation's OS/1 operating system, upon which IBM has based its latest AIX development. OS/1 is a version

of Unix put together by a consortium of companies (including IBM) that didn't like the partnership of Sun Microsystems Inc., the dominant player in the Unix workstation market, and AT&T Co., the developer of Unix.

According to sources, this consortium didn't want top competitor Sun helping to develop the next-generation Unix standard. AIX, as another "open" system, Apple and IBM announced they'd make PowerOpen technologies available to other vendors, though details have not been forthcoming.

An IBM RISC workstation running PowerOpen could offer industrial-strength power for Unix scientific/engineering and other vertical-market applications, and at the same time offer the popular Mac environment for personal productivity in a corporate office environment. With Microsoft's Windows NT struggling for the same desktops, the competition could get interesting.

— By Bob Weibel

# Developers are jumping on PowerPC bandwagon

By Jeff Uebels

Developers are enthusiastic about writing for the PowerPC

because of the increased speed and new features it will make possible.

Despite some uncertainties, software publishers are making firm commitments to port their applications to the new PowerPC machines.

"Every time you go to a new level of performance you get existing or new companies coming up with great ideas of what to do with it," said Eric Harslem, Apple vice president for desktop products.

A little less than a year ago, developing products for the PowerPC might have seemed a bit risky. But Apple now stresses that it will phase out the 68000 line and replace it with the PowerPC. "Three to five years from now I think all Mac customers except at the very low end will be buying the PowerPC," Harslem said.

Developers' reactions to the PowerPC and Apple's efforts to help them port applications are generally positive.

"Microsoft is very enthusiastic," said Benjamin Waldman, manager of Macintosh technology at Redmond, Wash.-based Microsoft Corp. "What is really exciting about the PowerPC is you have a lot more power available, and you know there are a lot of processor-intensive things that will work a lot better."

Although existing Mac applications will run under the PowerPC's emulation mode, "We want to go beyond that; you need native code to take advantage of the speed of the chip," Waldman said. "We'll have Word and Excel for the PowerPC available when [the PowerPC-based Mac] ships."

And for users, availability of software written in native code is key to justifying the purchase of a PowerPC-based machine.

**Developers' perspectives.** Developers of high-end applications share Waldman's enthusiasm, partly because of the chip's speed but also

for the new features it will enable.

"Color publishing just screams for more horsepower," said Dave Roberts, director of publishing products at Seattle-based Aldus Corp. Roberts added that faster speeds could also increase user productivity by allowing activities such as repagination to run in the background.

Programs that tax current Mac models — and sometimes their users' patience — should deliver much better performance and thus win a wider audience once ported to the PowerPC. Officials of Insignia Solutions Inc. of Mountain View, Calif., for example, said that SoftPC, its IBM PC emulator software, achieves 486 performance and more on RISC platforms.

Others argue that even routine applications could use more speed. "If you look at word processing, you might say you can type only so fast, so why do you need this kind of power?" said Brad Burnham, president of Echo Logic Inc. of Holmdel, N.J. "Yet there are people in the newspaper business, for example, where justification and hyphenation runs take forever, even on Quadras. There are also many users running large businesses on a spreadsheet, and for them even spreadsheets have become real CPU hogs."

Microsoft's Waldman agreed that the PowerPC will be a boon for users of large spreadsheets, especially those who want to add extra touches such as QuickTime movies.

Still, the appeal of lightning-fast traditional applications is limited. As Harslem put it, "MacWrite running 10 times faster won't have overwhelming appeal to the average user." So developers also are looking to create new applications and beef up existing ones with innovative features.

Most developers are vague about specific new features the PowerPC will enable, but voice recognition, handwriting recognition, modem-less telephony,

3-D graphics and video are usually mentioned.

**Multi-platform developers.** Companies that already have products running on multiple



platforms probably have an edge in developing for the PowerPC.

"We always want faster hardware, and we're not worried about porting difficulties because our software already runs on several platforms, including the RS/6000, from which the PowerPC is derived," said Doug Stein, member of the technical staff of the MathLink Development Group at Wolfarm Research Inc. of Champaign, Ill.

Chris Butler, manager of Macintosh development at Frame Technology Corp. of San Jose, Calif., said, "FrameMaker is already ported to 30 platforms, so we've worked through a lot of the kinks associated with going over to different architectures. We are very enthusiastic about making a PowerPC product."

Like Stein and others, Butler applauded Apple's efforts to help the developer community. "Apple has done a good job in getting information out to developers. Overall, the disclosure level has been pretty good," he said.

**Uncertainties.** Even developers committed to the PowerPC are wrestling with numerous uncertainties about marketing, the quality and availability of tools and compilers, and how to port their code.

Waldman said Microsoft was uncertain whether software for the PowerPC would be considered an upgrade or treated as a new and separate version. "We have to think about pricing and distribution issues," Waldman said. "For example, do you ship both versions in the same box? If you have two boxes, will dealers want to stock all your different versions?"

Manny Mendenhall, president of Deane Software of Miami, said his company would probably offer a PowerPC version of Canvas as an upgrade. "Right now, we are planning to handle it as an upgrade rather than a new version and [treat] the PowerPC as if it were just another Mac model," he said. "But, of course, that is subject to change without notice."

Others are thinking about poten-

tial technical problems. "There are tons of uncertainties," said Frame Technology's Butler. "Are the compilers good enough to produce good code? That is the one I am focused on."

Apple is pushing developers to use American National Standards Institute C code and will be offering a new C/C++ compiler developed with Lucid Inc. of Menlo Park, Calif. In the meantime, Apple recommends IBM Corp.'s compiler for the RS/6000 as an interim means to clean up old code.

Wolfarm's Stein also has doubts about the C compiler. "For us, the question is whether the C compiler Apple is going to use is good or not; if the tools are acceptable, then we are fine."

Third-party tools are another issue, but several companies are working on the problem. "We are working with Apple with the intention of supporting our development tools on the PowerPC," said Steven Levine, product marketing manager for the Bedrock framework at Symantec Corp. of Cupertino, Calif. "We think the PowerPC will provide excellent performance for developers using our cross-platform development tools."

**Porting the code.** Porting 68000 programs for the Mac — often written in a hodgepodge of Pascal, C, C++, assembly and other languages — to the right C code needed by the PowerPC is shaping up to be a serious challenge.

Developers have several options to choose from:

- Rewrite code from scratch.
  - Recompile their code if it is already in C or C++.
  - Translate their source code manually, then recompile.
  - Use Echo Logic's FlashPort binary-level translator.
  - Rely on Apple's 68000 emulator.
- According to developers, complete rewrites probably won't be necessary often. "The programmatic interface in the PowerPC will be identical to the Mac," said

Microsoft's Benjamin Waldman said the company plans to have PowerPC versions of its Word and Excel programs ready by the time PowerPC ships.

## PowerPC porting options for developers

PORTING METHOD	ADVANTAGES	DISADVANTAGES
Emulation	Free, takes no work	Slow
Recompile code	Fast, straightforward	Not always possible
Source translation	Quick test out	Details may take time to fix
FlashPort (binary translation)	Fast, handles multiple language types	Available from only one vendor

## Likely pitfalls for PowerPC developers

Developers already are beginning to get a sense of where problems are likely to crop up when porting their applications to PowerPC machines.

"There are three areas where people will get into trouble," said Doug Stein, member of the technical staff of the MathLink Development Group at Watforn Research Inc. of Champaign, Ill. "One is if they are depending on the control definition function, code that is inherently 68000 code; another is if they are using a lot of assembly language; and the third is the issue of floating point because the size of the floating point is different on the PowerPC from 68000 Macs."

Rich Norling, chairman and CEO of Language Systems Corp. of Herndon, Va., warned that many developers will have to modify their applications because the PowerPC provides only single- and double-precision math, not the extended-precision format available on the 68010 family.

"Applications that use floating-point data types can't use automatic translation an assembly language," he said. "Those folks will have to switch their application to double precision and compile." — By Jeff Uebels

Echo Logic's Burnham, "so rewrites are not to take advantage of new functionality but to improve the cross-platform capabilities and go back to clean up old code to improve performance and shrink code size."

For example, he said, developers may want to write a more GUI-independent code base so they can use shared libraries for their Mac and Windows versions.

**Pros and cons.** According to developers, programs written using ANSI-standard versions of C prob-

ably can be recompiled easily. "The compiler is going to be the most attractive option for people who have relatively portable code," Burnham said.

Companies with large investments in a Pascal code base have several options. Language Systems Corp. of Herndon, Va., is developing a

Pascal compiler that will create native PowerPC code. "We expect to ship in July, and the price will be a few hundred rather than a few thousand dollars," said company Chairman and CEO Rich Norling.

Sierra Software Innovation of Indio Village, Nev., is offering p2c, an automatic Pascal-to-C language translator. The company also offers engineering and translation services.

Assembly-language translation tools are available from MicroAPL Ltd. of London.

Echo Logic's FlashPort takes a

completely different approach. It performs binary-level translations to native PowerPC code from a variety of sources. The company, which is working closely with Apple, says its approach allows it to generate native PowerPC code from Mac applications written using different languages and different compilers.

"We don't care whether the code is Pascal, C, Modula 2, assembly or any combination of those," Burnham said. "When you do a source-level translation, you have a great sense of optimism because in a matter of a day or so it gives you 90 percent of the code automatically generated. But the question is, what does it take to fix the remaining 10 percent?"

Burnham said Echo Logic would announce prices and a shipping date soon.

Finally, the PowerPC also will run plain-vanilla Mac applications using an emulation mode expected to offer performance at least equivalent to the Mac IIx. Some companies will use the emulator to run portions of their code that they don't want to port.

Wolfman's Stein, for example, explained that Mathematics on the Mac uses two binaries, a kernel and the user interface. Wolfman may

simply port the kernel, which is where most of the performance increase will be noticed, and let the user-interface module run on the emulator.

Others say the emulator just isn't fast enough. "The emulator works very nicely, but it is slow compared with what the PowerPC is capable of doing," Butler said. "I wouldn't encourage someone to buy a PowerPC and run Frame-Maker in emulation mode."

**Worth the wait?** Clearly, the PowerPC is changing the way developers think about the Mac, their product lines, as well as emerging video, video and hand-writing applications.

The PowerPC also will transform Apple's networking strategies. PowerPC-based servers could help the company expand its foothold in corporate networks. And the chip's faster speeds could swamp existing networks, requiring 100-Mbps Ethernet or Fiber Distributed Data Interface.

Developers agreed that the availability of software is vital to the success of the PowerPC. Ultimately, how quickly users begin adopting the PowerPC is directly related to when PowerPC software really becomes available. □

## Guest editorial by Michael Slater

# How does PowerPC stack up?

Apple's decision to adopt the PowerPC architecture will have enormous implications for users of Macintosh computers. While Apple plans to continue building 68000-family Macs, the PowerPC machines promise to offer superior price and performance and, therefore, should be very attractive to most Mac users.

Apple promised a nearly seamless transition to PowerPC, with full emulation of the 68000 instruction set to allow users to run existing programs in lieu of new PowerPC versions.

While Apple claims that the emulator will provide performance comparable to today's midrange Macs, it remains to be seen how fast and trouble-free it will really be.

Apple surely will work hard to make the transition to PowerPC as easy as possible, yet it is still likely to involve some grief—at least as much as the conversion from System 6 to System 7 or from a 68030 machine to a Quadra, both of which required new versions of many applications.

**Fight or switch?** Now that nearly all of the major Mac applications are available for Windows as well, Mac users facing a transition to PowerPC will have to consider whether they should follow Apple or make the switch to Windows.

At the heart of each of these platforms is the microprocessor—PowerPC in the case

of the future Macintosh and the 486 and Pentium microprocessors for Windows. Since benchmark ratings for both PowerPC and Pentium remain undisclosed, exact comparisons are impossible, but preliminary information indicates that the two processors will be comparable in performance, and both are on similar production schedules. There, however, the similarity ends.

The Pentium microprocessor is burdened with an antiquated instruction-set architecture, resulting in a much larger, more complex chip to achieve the same performance level.

The first PowerPC chip, the 601, includes 32 Kbytes of cache memory on a 2.8 million-transistor chip that measures about 11 millimeters square. The Pentium chip includes only 16 Kbytes of cache memory but requires more than 3 million transistors and is larger than 16 millimeters square. This comparison makes it clear that the burden of Pentium's old CISC (complex instruction set computing) architecture is significant, Intel's hype aside.

In other words, PowerPC has a significant architectural advantage, and PowerPC processors at a given performance level should be much less expensive than comparable x86 processors.

While pricing has not been released, Apple has said in the past that it considers

\$50 to be the required price for a high-volume processor. It will be a very long time before Pentium comes down that far. The PowerPC is likely to offer Pentium-level performance at less than 486DX prices.

Unfortunately, it is not ensured that a chip-level price advantage will translate into a system-level price advantage for users. Because of Apple's proprietary approach, Mac users don't benefit directly from the intense competition of the IBM PC and compatible market since the configuration and pricing of PowerPC Macs is entirely up to Apple.

What about PowerPC systems from other vendors? Isn't this supposed to be an open architecture? Well, not really. Yes, there is supposed to be a version of Unix for the PowerPC available to other vendors, called PowerOpen, that will be able to run Macintosh applications.

But PowerOpen will require much more RAM and disk space than Apple's PowerPC Macs, which will run a ported version of System 7, making it impossible for any other vendor to compete with Apple at the high-volume price points. PowerPC allows Apple to create an impression of openness without having to cope with direct competitors.

**PowerPC alternatives.** Windows users soon will have the alternative of using Windows NT, which will run on the MIPS and Alpha architectures as well as the x86. With MIPS, at least, there will be chips

that provide comparable performance to the PowerPC chips at similar prices, and systems based on these processors could be a potent alternative to PowerPC Macs.

In addition to having a true multivendor environment, these systems will have the advantage of a robust, multitasking, multithreaded operating system.

Apple, on the other hand, is still stuck with an outdated, mediocre operating system underlying its nice user interface. Apple has plans in place to move to a more capable, microkernel-based operating system, but it appears that this transition will take years and will introduce some major software incompatibilities along the way.

To keep high-end Mac users from migrating to Windows NT, Apple needs to move much more aggressively to enhance its operating system. And as long as Apple continues with its proprietary software strategy, Mac users will be held hostage to Apple's system design decisions and pricing policies. □



Michael Slater is the president of MicroDesign Resources of Sebastopol, Calif., where he serves as editor in chief of the *Microprocessor Report* newsletter and the program director for the *Microprocessor Forum* conference. Before founding MDR, he worked for 10 years as a hardware design engineer and consultant.



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### Ten Essential Programs For Everyone

CATEGORY	SHAREWARE	FILENAME & LOCATION
Antiviral	<b>Disinfectant:</b> The premier antiviral utility all Mac users should have.	DISINF.SIT Library 8
Compression	<b>Stuffit Lite:</b> Free up hard disk space and decompress files downloaded from ZiffNet/Mac with the ruling monarch of Mac compression utilities.	SITLITE.SEA Library 1
Font Management	<b>Carpetbag:</b> Manage your font and sound collections with this shareware control panel.	CARPET.CPT Library 3
Calendar	<b>Calendar DA:</b> This simple and elegant monthly calendar has space for daily appointments.	CALEND.SIT Library 2
Paint Programs	<b>LightningPaint:</b> A deluxe paint program that won't paint you into the poorhouse!	LPAINT.CPT Library 1
Personal Information Manager	<b>Address Book:</b> This nifty application has a great search engine, dials phone numbers and prints envelopes, labels, Rolodex cards and DayTimer sheets.	ADDRBK.SEA Library 1
Screensaver	<b>Darkside:</b> Protect your screen from burn-in — try Darkside, a mondo cool screensaver.	DARKSI.CPT Library 1
Spreadsheet	<b>Mariner:</b> Spread your sheets to the wind with Mariner, a superb shareware spreadsheet with a dazzling interface.	MARINE.CPT Library 1
Telecom	<b>ZTerm:</b> It does scripting, macros and lots more. May be the only program you'll ever need for telecommunicating.	ZTERM.CPT Library 1
Word Processing	<b>miniWRITER:</b> A great text editor that's perfect for small notes, memos and so on. A must-have for composing messages off-line for online services.	MINIWR.SIT Library 2

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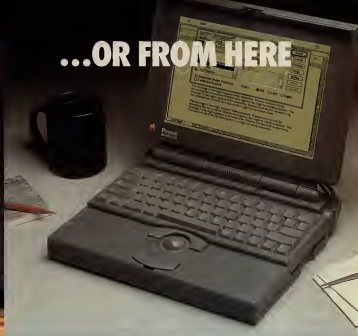
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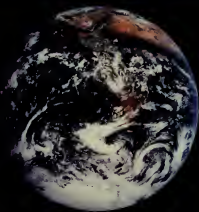
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# Reviews



## Photoshop shines brighter with move to Version 2.5

*Better speed, improved separations, new tools and open architecture highlight solid upgrade.*

By Bruce Fraser

Adobe Photoshop is one of the great Mac applications. It is feature-rich and useful in a wide variety of situations for both creative work and production. The application has been one of those responsible for putting Macs, rather than some other kind of box, on people's desks, and its plug-in modules have become a de facto standard, spanning a mini-industry of third-party add-ons.

Now the long-awaited upgrade to Photoshop, Version 2.5, is here. It isn't quite as dramatic a leap forward as was the upgrade from Version 1.0 to Version 2.0, and the \$895 program won't turn your Mac into a Quintel Paintbox, but it's a very worthwhile effort nonetheless.

The new features are well-thought-out, making many of the program's more advanced features much more accessible, and the performance enhancements are significant, although not startling. The quality of the color separations also has improved, particularly in the handling of very saturated colors. Individual features aren't dramatically faster than in its predecessor (pending the availability of 2.5-sexy acceleration hardware), but overall it's a much more productive tool.

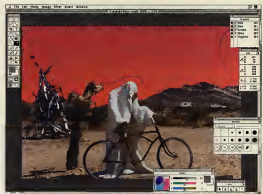
The Photoshop Toolbox looks almost unchanged. One new tool, Dodge and Burn, replaces the Pen tool that now resides on the Paths palette. Dodge and Burn works very much like its traditional darkroom counterpart, letting you selectively lighten or darken areas of the image in a way that anyone with darkroom skills will find immediately intuitive.

Like most of the other tools, Dodge and Burn is pressure-sensitive when used with a pressure-sensitive stylus and digitizing tablet, such as those from Wacom Technology Corp. (see story, Page 50). The color swatches representing the current background and foreground colors have two refinements: You can click a Switch Colors icon to reverse foreground and background, or reset the foreground and background to black and white (or whatever defaults you have set) by clicking the Default Colors icon.

Tool size, pressure and opacity

are now controlled from a floating Brushes palette. The various brush modes are selectable from a pop-up menu, and you can choose a variety of soft- or hard-edged brushes in different sizes. You can create, save and load custom brush shapes.

The other new Toolbox element is the Quick Mask feature. Clicking the Quick Mask icon lets you use any of the painting tools to create a mask directly on the image, without resorting to paths or alpha channels. The point this applied is translucent, so you can still see the masked elements in the image. To make a soft-edged mask, you simply use a soft-edged brush. Clicking the adjacent



Photoshop's palettes for Channels and Paths make dealing with multiple masks much more accessible, and a Quick Mask mode lets you paint a mask directly on the image.

Standard Mode icon returns you to normal mode, with the rest of the image, excluding the masked area, selected. For creating simple masks, this is a major timesaver. More-complex masking has been

made easier thanks to two new floating palettes: Channels and Paths. The Channels palette resembles Aldus Freehand's Layers palette; you can click to make channels visible.

See Photoshop, next page

### score card

#### Adobe Photoshop

Adobe Systems Inc.  
Version tested: 2.5  
List price: \$895\*  
Overall value: ★★★★★

With Photoshop 2.5, an already great application just got better. The many new features are well-considered, well-implemented and provide a real productivity boost both for creative work and routine production tasks. The new virtual-memory scheme significantly reduces the penalty exacted by insufficient RAM, the new screen-redrawing technique is noticeably speedier, new color-separation algorithms provide a marked improvement over their predecessors, and a new open architecture holds great promise for future third-party acceleration. The upgrade may not be totally bug-free, but any minor problems are more than outweighed by the very considerable advantages the new version offers. This upgrade is highly recommended.

Performance ★★★★★  
Features ★★★★★  
Ease of use ★★★★★

Documentation/support ★★★★★

\*Upgrade from Version 2.0, \$129; upgrade to CD-ROM version, \$199.

### RATINGS KEY

★★★★★ Excellent  
★★★★ Very good  
★★★ Good  
★★ Fair  
★ Unsatisfactory

## LaserWriter Pros keeping up with LaserJets

By Rick LePage

The unceasing volatility of the PostScript printer market has forced longtime market leaders such as Apple and Hewlett-Packard Co. to ship products that feature leading-edge technology at much lower prices than previous models. The \$2,099 LaserWriter Pro 600 and the \$2,529 LaserWriter Pro 630 are Apple's latest responses to these challenges.

The LaserWriter Pro 600 and 630 are targeted directly at HP's \$2,399 LaserJet 4M (and use the same engine as that printer), but they are also price-competitive with other high-performance printers from other manufacturers.

The 600 and 630 also replace the LaserWriter IIfx and IIfx at the top of Apple's PostScript printer line. (The IIfx and IIfx are still on Apple's price list, although it is reasonable to expect that they will be discontinued after inventory has been reduced.) As with the main differences between the IIfx and the IIfx, the 600 and 630 differ in interface options. The 600 has LocalTalk, serial and parallel interface options; the 630 has the same options and adds EtherTalk and SCSI interfaces.

As is the case with most PostScript printers available today, the LaserWriter Pro series features an all-ports-active mode that allows you to

send print jobs from different network connections simultaneously. We were able to print consecutive jobs from both serial and LocalTalk connections with our 600.

**Start your engines.** The LaserWriter Pro 600 and the 630 feature Adobe Systems Inc.'s PostScript Level 2; HP's PCL 4+ emulates See Photoshop, Page 48

### score card

#### Apple LaserWriter Pro series

Apple's LaserWriter Pro 600 and 630 use the same Canon EX 600-dpi print engine found in Hewlett-Packard Co.'s LaserJet 4M, the printer that the 600 and 630 will be immediately compared with. Instead of the 4M's speedy RISC processor, the LaserWriter Pro uses a 25-MHz 68030; as a result their performance is a bit behind HP's offering but still comparable to or better than existing 300-dpi printers. On the whole, Apple has produced extremely competitive printers at very good prices.

► **LaserWriter Pro 600** is the bargain model, lacking only two features found in the 630. The performance is the same as the 630, and its low price makes it a good buy for users on a budget who still want high-resolution output.

► **LaserWriter Pro 630** has built-in Ethernet and SCSI capabilities, making it more versatile than its lower-priced sibling and, in our opinion, a better buy than the 600 for savvy users.

	LaserWriter Pro 600	LaserWriter Pro 630
Overall value	★★★★	★★★★
Price	\$2,099*	\$2,529*
Performance	★★★★	★★★★
Features	★★★	★★★★
Configuration	★★★	★★★★
Compatibility	★★★★★	★★★★★
Documentation/support	★★★★	★★★★

\*LaserWriter Pro 500-Sheet Feeder, \$399; LaserWriter Pro Desktop Feeder, \$399.

## Photoshop

From previous page

ble or invisible or to make them editable or locked; Shift-clicking can produce any combination thereof. A pop-up menu lets you create, name, delete and save channels. New channels appear in the palette with their associated Command-key shortcuts.

You can designate a color that will be used to display mask channels when they are overlaid on the image and choose to have the color overlaid on the masked area or over the selected area. Alpha channels also appear by name on the Load Selection pop-up menu, so you can quickly and easily load selections from different channels.

The Pen tool has been moved to the Paths palette, along with tools for adding, deleting and selecting points on a path as in Adobe Illustrator. Paths can take up much less disk space and memory than alpha channels, particularly when the selection outline is simple, and some selections are easier to draw with the Pen than with the Lasso. You can freely convert Paths to Selections to Channels using the Make Path, Make Selection, Load Selection and Save Selection commands. This is particularly useful with complex projects involving multiple image sources.

In addition to the Color Picker, you can now use the Colors palette to

define colors and save sets of colors as color libraries. Photoshop includes predefined color libraries for Pantone coated and uncoated stock, Pantone process color simulations, and Toyo, Focitone and TruMatch ink sets. You can work with colors in RGB (red, green, blue), HSB (hue, saturation, brightness), CMYK (cyan, magenta, yellow, black) or CIE Lab color models and use any of the painting tools to experiment in a color-mixing area. The gamut alarm from the Color Picker is present in the Colors palette, too.

You can now preview the results of adjustments made using the Curves, Hue and Saturation, and Color Balance controls, which makes them both faster and easier to use. You can use the Levels, Contrast and Brightness controls interactively on the whole screen, as in previous versions, or you can use a preview, which takes a little longer but affects only the selected area.

**Variations.** One further goodie lurks under the Adjust submenu: the Variations command. This lets you adjust exposure and color balance for shadows, midtones and highlights by choosing a variation of the image from a ring-around display, a kind of miniature version of Electronics for Imaging Inc.'s MultiChoice tool in Cachet. For reference, the original image and the current pick, which shows the cumulative effect of all the choices you've made, are displayed above the ring-around. You can set the degree of coarseness of the steps between the different variations. Fine is almost imperceptible, while Coarse is very obvious. A clipping alarm highlights clipped pixels. For the *piece de resistance*, you can save all the changes you've applied to an image as a script, which you then can load and apply to other images, providing a fairly powerful batch-processing capability.

**Interface.** Some useful enhancements have been made to the user interface. The screen can quickly become cluttered with floating palettes, so each palette can be collapsed or expanded via a zoom box. Pop-up menus remain available when the palette is collapsed. Pressing the Tab key hides all floating palettes, including the ToolBox.

A new Preferences option, Function Keys, allows you to assign the function keys on the extended keyboard, with or without the Shift key, to any menu command, including those that show and hide the palettes. You can save and load different function key sets.

**Revving up.** The new features add up to increased flexibility and productivity, but important changes have taken place behind the



As in Cachet's MultiChoice window, Photoshop's Variations window displays exposure and color-balance adjustment options, and lets you choose between them with a click.

hood, too. The most immediately obvious change is in screen redrawing, which is now done in tiles, rather than line by line. This makes zooming in on details much faster, particularly when working with high-resolution images.

Slightly less obvious is an entirely rewritten virtual-memory scheme. It's still highly desirable to have enough RAM to hold the entire image plus the scratch and undo files, but now there's much less of a penalty for using virtual rather than real RAM — performance becomes less miserably slow. The new virtual-memory scheme also lets you designate a second scratch disk for Photoshop to use in the event that the first one fills up.

**CIE space.** Photoshop now uses the CIE Lab color space for all its internal color values. The Lab model is particularly useful when you need to edit color and luminance values separately. And since it's a device-independent color model, it should, in theory, result in identical color on different printers and monitors, as long as they've been properly calibrated, and within the limits of the different devices' color gamuts. It's the preferred color model for use when printing to PostScript Level 2 devices. When you send Lab data to a Level 2 printer, it's converted to the printer's native color space within the printer itself, using the printer's own color-rendering dictionary.

The new version claims to support Apple's ColorSync color-management extension, but as yet we haven't been able to evaluate ColorSync support because of a dearth of ColorSync profiles.

**Booster rockets.** The benefits of another major change will take a little longer to appear. With Version 2.5, the architecture of the program has been opened up. Previously, vendors who wanted to accelerate

Photoshop functions using digital signal processor (DSP) boards were constrained to going through the Filter interface. With Version 2.5, many features that do not fall under the Filters heading can also be accelerated. As a result, functions such as rotating, resizing and RGB-to-CMYK color transformations are now fair game to third-party DSP vendors — Adobe has announced an "Adobe Charged" certification that will guarantee 100 percent compatibility between conforming third-party accelerated routines and native Photoshop functions.

Several third-party acceleration vendors, including SuperMac Technology Inc., Storm Technology Inc., DayStar Digital Inc., and Spectra Technologies Inc. and Spectral Innovations Inc., have announced new or upgraded DSP-based acceleration for specific functions in Photoshop 2.5. None of these shipped in time for evaluation in this review.

**A separate peace.** The color-separation algorithms have been rewritten to great effect. The new version does a much better job of handling highly saturated reds, and the problem of too much magenta in the blues also seems to have been cured. We haven't yet had a chance to do exhaustive evaluations of the new separation algorithms, but the results we've obtained so far indicate that they're much improved over the old ones.

**A little slower.** Photoshop 2.5 isn't perfect. Because the new version is much larger, it does more swapping of code segments in and out of memory. This occasionally leads to slightly sluggish behavior, particularly on slower machines. As an IIfx, we've noticed a slight but perceptible delay between selecting a tool and having that tool available for use, and menu commands invoked by Command-key combi-

nations aren't quite as snappy as they were in Version 2.0.1. The program takes much longer to launch than its predecessor — exactly how long depends on how many third-party filters you have loaded — and files saved in Photoshop 2.5 format take a little longer to open than Photoshop 2.0 files. Tools used with large soft-edged brush settings are slow enough to be quite difficult to use. Given the overall improvements, though, these are fairly minor complaints.

Upgrades from Photoshop 2.0a are \$129. An optional CD-ROM version, available only as an upgrade, is \$199. In addition to the Photoshop 2.5 upgrade, the disc contains many user tips, demo versions of third-party filters and tutorial files.

### There's a gnot in my soup.

Any program as large and complex as this is almost certain to have some bugs. We haven't found any obvious reproducible problems, but we did experience a handful of random crashes. A few Quadra users on CompuServe's Adobe Forum have reported occasional spurious out-of-memory messages, and some IIfx users have reported unusually slow performance. We've found that preview icons don't always show up, even after we've sent a message informing us that the program is creating one.

Photoshop 2.5 seems backward-compatible with most third-party plug-ins. The only one we've had break so far is SuperMac's ThunderStorm Resize function.

**Conclusions.** We'd like to see these problems fixed as soon as possible, but none seems serious enough for anyone to hold off on upgrading: the many advantages of the new version more than outweigh the few minor difficulties we've encountered. Adobe probably could have gotten away with calling this Photoshop 3.0, and the fact that it didn't whets our appetite. Photoshop 2.5 won't make the Macrival high-end color workstations, but it's quite a bit more than an incremental upgrade. For serious Photoshop users, it's a must-have.

Adobe Systems Inc. is at 1585 Charleston Road, Mountain View, Calif. 94039-7900. Phone (415) 961-4400; fax (415) 961-3769. □

### SYSTEM 7 COMPATIBILITY

#### Adobe Photoshop 2.5

Balloon help	No
TrueType	Yes
Publish and subscribe	Yes
Apple events	No
32-bit addressing*	Yes

\*According to vendor



Photoshop's Colors palette lets you edit, save, merge and load color libraries, including Pantone, Focitone, Toyo and TruMatch colors, in addition to custom libraries.

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## LaserWriter

From Page 45

tion also is built in. The printers are based on the 8-page-per-minute Canon EX marking engine, a true 600-dpi printer. As we reported when we evaluated the LaserJet 4M (see MacWEEK, Oct. 26, 1992), the output from this engine is stunning. At 600 dpi, type is crisp, even at small point sizes, and solid fills and blacks print much more evenly and richer than pseudo 600-dpi printers we have looked at.

The 600 and 630 each ship with 8 Mbytes of RAM, and the printers' memory can be expanded to 32 Mbytes. The 8-Mbyte configuration allows the printers to take advantage of Apple's proprietary FinePrint type-smoothing and PhotoGrade image-enhancement technologies, both of which are built into the printers' firmware.

A 250-sheet letter-size cassette and a 100-sheet multipurpose tray come with the printers. An envelope feeder and a second 500-sheet feeder also are available as options.

We were disappointed to find that the LaserWriter Pros lack a straight-through paper path, which is convenient for special paper types, envelopes and labels.

**Setup.** As has been the case with most Apple printers, the LaserWriter Pros' hardware and software setup is generally very good. Apple includes a well-designed caddy for lifting the 39-pound printer out of its box. The toner cartridge is spill-proof and installs easily.

The documentation for setup is clear and concise, in most cases definitively up to Apple standards.

Apple includes a set of Mac TrueType fonts on disk with the LaserWriter Pro 600 and 630. These fonts are supplied in addition to the set of 35 LaserWriter-standard fonts (Avant Garde, Bookman, Courier, Helvetica, Helvetica Narrow, New Century Schoolbook, Palatino, Symbol, Times, Zapf Chancery and Zapf Dingbats) that are available in the printers' ROM.

All of the fonts are installed with the LaserWriter 7.2 driver that ships with the printers, but Apple's Installer provides no mechanism to customize the installation process. All of the fonts are installed, whether you want them or not. The documentation doesn't mention this, and it also fails to discuss a method for installing the driver and fonts manually.

On the positive side, Apple

includes a DOS disk for installing the printer software under Microsoft Windows. The documentation includes installation information and troubleshooting tips for Windows. We were able to install and use the LaserWriter Pro software without incident on our 386 machine from Northgate Computer Systems Inc.

**Doing the print thing.** The LaserWriter 7.2 driver offers slight variations from previous Apple print drivers, but it is not the long-awaited Level 2 version. That driver is now scheduled to ship next month.

The main difference from earlier Apple drivers is evident when you use the Chooser to select a

printer. A Setup button has been added that queries the selected LaserWriter Pro and installs the proper paper-handling options into the Print dialog box. You have to perform this operation only when you first set the printer up or when you add an optional item such as the envelope attachment.

## BENCHMARKS

Apple LaserWriter Pro series\*  
(Times in minutes; lower is better)

## Font-download document (3 pages)



## Mixed-font document (12 pages)



## Complex long document (24 pages)



The downloadable font and mixed font tests were run from Microsoft Word 5.0 and look at printer memory management, font rendering and engine speed. The complex long document test was run from Aldus Pagemaker 4.2 and tests acquisition and processing of large amounts of data and general performance.

\*The LaserWriter Pro 600 and 630 use the same 63030 processor; in our tests, the print times for the 600 and 630 were statistically identical. The LaserWriter Pro 600 and 630 and LaserJet 4M can print at both 300 and 600 dpi; setting on the LaserJet 4M was performed only at 600-dpi resolution. The LaserWriter IIg and RealTalk Laser are 300-dpi printers.

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The settings for the printer are stored in the LaserWriter Preferences file in the System folder.

When you print from within an application, the Print dialog box reflects your printer's capabilities. You can choose which source tray to use for the first page and have the subsequent pages print from another paper source. This feature is not as expansive as the multiple-tray selector found in printers such as Dataproducts Corp.'s LZR series, but it works satisfactorily.

The other addition to the Print dialog is the capability to select the

Clean 600-dpi output, PhotoGrade support and versatile paper-handling features make the LaserWriter Pro good buys.

print resolution and, if 300-dpi output is selected, you also can select to turn on FinePrint and PhotoGrade.

**Reading the FinePrint.** As mentioned earlier, the quality of output from the 600 and 630 is very good. Even when compared with printers that use enhanced 300-dpi engines—such as Xante Corp.'s Accel-A-Writer 9000 or LaserMaster Corp.'s Unity 1000—the Apple printers shine.

When we compared 600-dpi output from a LaserWriter Pro 630 and a LaserJet 4M, we felt that the results were comparable, with HP having a very slight advantage in type readability. This is a result of HP's Resolution Enhancement Technology (RET), which smooths the jaggies in printed lines. Apple's FinePrint performs many of the same types of functions as RET, but it is not available at 600 dpi.

**Giving PhotoGrade an A.** PhotoGrade, Apple's gray-scale enhancement technology, also can be used only at 300 dpi, but the results you can achieve with PhotoGrade make it worthwhile to use. We printed a number of gray-scale images and PostScript files with pattern fills and found that they looked better when printed at 300 dpi with PhotoGrade on than when printed at 600 dpi.

The memory required to process an image with PhotoGrade is substantial, which is the most apparent reason for PhotoGrade not being available at the higher resolution.

As a result, you'll have to use 300 dpi if you want the best image reproduction you can coax out of your printer.

You can use FinePrint to smooth type at the lower resolution; it won't enhance 300-dpi type well enough for you to mistake it for 600-dpi output, but it is markedly better than straight 300-dpi type (see print samples at right).

**Performance.** Unlike the LaserJet 4M, which uses Intel Corp.'s 20-MHz i80960 RISC chip, the LaserWriter Pro series is driven by a 25-MHz 68030 CISC (complex instruction set computing) processor. Apple has used the 68030 series in its PostScript printers since the original LaserWriter and obviously feels no need to move to RISC at this time, choosing instead to use custom application-specific integrated circuits and I/O processors to help optimize performance.

Using our standard benchmark files, we found that the lack of a RISC chip results in a small performance penalty when compared with the LaserJet 4M, but the results were generally insignificant.

The biggest discrepancy between the LaserWriter Pro 630 and the LaserJet 4M was in our complex, 24-page Aldus PageMaker document. In other tests the time differences were much closer, but the LaserWriter Pro 630 was almost always slower than the printers we compared it with (see benchmarks, previous page).

When we tested the LaserWriter Pro 600 against the 630, the time differences were negligible, although the 600 was generally a second or two faster than the 630 in all tests. Testing the performance of 300 dpi vs. 600 dpi also turned up generally minor speed improvements at the lower resolution, although the PageMaker file printed more than one minute faster at 300 dpi.

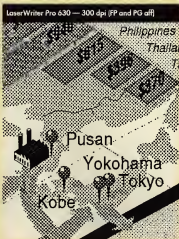
We were unable to test the LaserWriter Pro 630's Ethernet connection; we hope to test it for upcoming reviews of other network printers and will report the results when they are available.

**Conclusions.** In general, Apple has yet again been able to produce price- and feature-competitive PostScript laser printers in a timely fashion. While the LaserWriter Pro 600 and 630 might not be the fastest in their class, their clean 600-dpi output, PhotoGrade support and versatile paper-handling features make them very good buys.

We would like to see a way to incorporate at least some of PhotoGrade's functionality into 600-dpi output, however.

The software installation prob-

## Sampling the LaserWriter Pro 600, 630



Three of the print samples shown here are from a LaserWriter Pro 630: one at 600 dpi, one at 300 dpi with FinePrint and PhotoGrade on, and one at 300 dpi with no enhancement (used as a reference image). The fourth sample is from a Hewlett-Packard LaserJet 4M at 600 dpi, with Resolution Enhancement Technology (RET) turned on. The samples, printed from Adobe Illustrator, have been blown up 185 percent. The 600-dpi LaserWriter and LaserJet 4M samples show the crisp type, decent fills and rich blacks found in the Canon U.S.A. EX engine. HP's type is slightly denser,

thanks to RET, but both printers' output is very good. The sample with FinePrint and PhotoGrade enabled shows off PhotoGrade's excellent ability to enhance gray-scale images and fills. The dot patterns found in the PhotoGrade-processed sample are lighter than any of the other printed images, even though the LaserWriter is printing at only 300 dpi. Also notice that although FinePrint improves the lack of 300-dpi type, it doesn't bring it quite to the level of true 600-dpi output. Choosing to print at 600 dpi or an enhanced 300 dpi will be based largely on the type of document you are printing.

lems should be cleared up, and we would like to see Apple include

PostScript Printer Description (PPD) files for PageMaker and Adobe Illustrator and Quark Inc. PDF files for QuarkXPress. Many printer vendors routinely include these important files with their products, and Apple should do the same. (PPD files for all of the new Apple printers are available on AppleLink and Compuserve in the Adobe forum.) The only other

limitation we see is the lack of a straight-through paper path.

Choosing between the 600 and the 630 should be fairly straightforward. Ethernet support is important, and many people will purchase the 630 for that reason alone, but we think more-savvy users will buy the 630 solely for its SCSI port. Service bureaus and users with heavy investments in fonts generally add a hard disk to their printer to improve throughput. This was one

area where HP got chastised with the LaserJet 4M, and Apple has at least made one model available that supports this feature.

The LaserWriter Pro 600, priced \$430 less than the 630, is a good choice for the budget-minded user who wants 600-dpi output at a lower price point. Given that the performance of the 600 is comparable to that of the 630, you are losing only Ethernet and SCSI support. □

# Wacom's state of the ArtZ: Pressure sensitivity with ADB

*Smooth tablet, pen  
for ballpoint price*

By Philip Kishop

Wacom Technology Corp. has introduced a new pressure-sensitive digitizing tablet to compete with its older models.

Unlike earlier serial devices, the 6-by-8-inch ArtZ connects to the Mac's Apple Desktop Bus but offers better performance, less hassle and more compatibility with most Mac setups than Wacom's other tablets. The tablet also is honored to whittle the price of pressure-sensitive art work downward: It has a list price of \$449 (and can be purchased on the street for about \$325).

Many graphics applications have added support for pressure-sensitive tablets, including Adobe Photoshop, Aldus FreeHand, Deneba Software's Canvas, and Fractal Design Corp.'s Painter and Sketcher. Pressure sensitivity allows graphics users to create more-natural-looking pen and brush strokes and vary the width and other characteristics of brushes without changing tools.

Wacom said the ArtZ operates at speeds of about 100 dots per second, which is about the same as the company's original serial tablets. At lower speeds, input devices

can suffer a marked drop-off in performance—smoothly curved lines become segmented, for example.

The ArtZ draws its power from its ADB connection. Unlike serial connections, which operate at fixed speeds, ADB performance is dependent on CPU speed, so the faster your CPU the better the ArtZ should perform.

We tested the ArtZ on a Quadra 900 and a Mac LC and, remarkably, didn't notice any degradation in the tablet's performance on the slower machine. Many of the programs that take advantage of the Wacom, however, work much better on higher-end Macs. While your brush strokes may be just as smooth on an LC, waiting several seconds for each stroke to appear, as is possible with a program such as Painter, can be frustrating.

**ADB advantage.** The key advantages of an ADB tablet are that it is as easy to install as plugging in a mouse or a keyboard, plus you free up a serial port. In fact, you can plug your ArtZ directly into keyboards with two ADB ports.

The tablet is about the size of a mouse pad. The ArtZ currently lacks a second ADB connector to let you daisy-chain ADB devices, so it has to go at the end of the line.

Wacom said it will be supplying a cable with two ADB connectors in future versions of the ArtZ. The tablet, which is less than a half-inch thick, weighs only 1.8 pounds, which makes it ideal for work on your lap. The 6-foot ADB cable allows plenty of freedom of movement.

The ArtZ has a transparent plastic cover for holding artwork you want to trace. The only other notable feature on the unit is a small status light in the upper right-hand corner and a small button on the front edge of ArtZ for starting up your Mac.

**Sharpened pen.** The ArtZ ships with a new Wacom pen—the UP-201—but a puck is not available. Replacement pens cost \$125. The UP-201 weighs 8 grams (less than a third of an ounce). Not only is it lighter than Wacom's earlier pen, it's thinner too.

The UP-201 is the first Wacom pen to offer a barrel switch, something the company's competitors—CalComp Inc. and Kurta Inc.—have long offered. This can be assigned various functions, such as double-clicking or launch-

ing a macro, through the Wacom control panel.

Wacom's pens are remarkably light because they don't require batteries, and the UP-201 is no exception. Every 20 microseconds, the tablet determines the pen's position and the degree of pressure applied. The software in turn translates this data into coordinate position or line thickness, color hues, brush sizes and other characteristics. Other vendors' pens are powered by batteries, which makes them heavier and requires periodic battery changes.

The ArtZ tablet, in combination with the UP-201 pen, is a joy to use and performed flawlessly in tests using Painter, Sketcher, FreeHand and Photoshop.

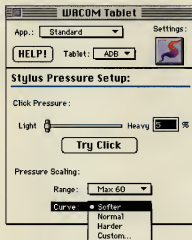
It performed almost as well for navigation in applications as it did when used for graphic arts tasks. Wacom's new tablet is an improvement of a peripheral we thought was very good already.

**New software.** In the previous version of Wacom's driver software, if you wanted to double-click on an item you had to tap the exact same pixel twice. The new driver software, which debuts with the ArtZ, lets you set up a "hot spot" of up to 15 pixels wide. While this may be helpful to beginners, we found that this feature, called Click Assist, actually slows the pen's responsiveness.

You're better off configuring the barrel switch as a double-click or configuring a function key for this command. The new driver software lets you customize pressure settings, apply special tablet-to-screen scalings and launch macros with the touch of the pen; it works only with System 7, however.

The ArtZ supports 120 levels of pressure, double the sensitivity of Wacom's other tablets. More levels of pressure means you have greater control over the weight of a line or the amount of color applied.

Aside from Painter and Sketcher, Wacom couldn't identify other programs that support the new range of pressures, although we expect such support won't be long in coming. The Pressure Scaling Curve, possibly the most impressive innovation in the new software, lets you customize how pressure is reported to an application. By rearranging seven sliders in the Custom Pressure window, you can create a pressure curve tailored to the way you use the pen. For example, you could adjust the sliders so



that the pen doesn't register as much pressure when you first begin your stroke, thus avoiding the beeping at the beginning of a line, for example, when using watercolor tools in Painter. Some applications have their own pen adjustments, which you can use to further refine control.

The control panel uses several panes: Stylus, Pressure, Scaling and Screen Macros. Each has a pop-up menu, called App., which lets you provide custom settings for a particular application.

Screen Macros are Wacom's answer to CalComp and Kurta, which provide buttons on their tablets that can be configured to perform a variety of actions, such as launching an application or choosing a menu item.

Screen Macros are functionally the same as these buttons, but with the ArtZ, actions are selected by choosing an item from a list you can display on the screen. While this method has great virtue, to display the applications list, you must assign the barrel switch to this function, precluding it from use for anything else. Optionally, you could program the barrel switch to double-click, mimic a Shift or Option key, execute a keystroke, or launch a macro created by CE Software Inc.'s QuickKeys or Affinity Microsystems Inc.'s Tempo Custom (which is bundled with the tablet).

In most respects, Screen Macros are preferable to macro buttons on the tablet, although adding them individually, rather than in groups, is tedious. We think Wacom should add a second button to the pen, as with Kurta's offering, or at least offer a hot key to pop up the macro list.

The ArtZ and earlier Wacom hardware and software are mutually incompatible, although the ArtZ pen will work with Wacom's PL-100 desktop LCD tablet. The company said a backward-compatible version of the new driver for all other Wacom tablets and System 6 should be available by the end of April.

The Pressure Scaling Curve lets you customize how pressure is reported to applications. For example, the Softer setting makes the stylus more sensitive, while Harder makes the stylus less sensitive.



You can launch QuickKeys or Tempo Custom macros from ArtZ software and make sets of macros for applications.

**Conclusions.** Pressure-sensitive digitizing tablets with cordless pens are no longer limited to Wacom, but the company's new ArtZ—with ADB convenience, fast performance, the sleekness of pens, and considerably enhanced and customizable software—is another stroke against the competition. Some parts of the new software could be easier to use, but this grip is easily put in perspective by the ArtZ's low price. If you need a larger tablet, you'll have to look elsewhere, but Wacom's ArtZ sets a new standard for digitizing tablets.

Wacom Technology Corp. is at 501 Columbia Shores Blvd., Suite 300, Vancouver, Wash. 98661. Phone (206) 750-8882; fax (206) 750-8924. □

## SYSTEM 7 COMPATIBILITY

ArtZ	
Balloons help	No
TrueType	n/a
Publish and subscribe	n/a
Apple events	Yes
32-bit addressing*	Yes

\*According to vendor

## score card

### ArtZ

Wacom Technology Corp.  
List price: \$449  
Overall value: ★★★★★

Wacom is renowned for its high-quality, serial-based digitizing tablets. The ArtZ attaches to the Apple Desktop Bus and has performance similar to or better than the serial devices. It features a highly responsive, extremely light pen and new driver software (which has a few rough edges) that lets you customize pressure settings, apply special tablet-to-screen scalings and launch macros with the touch of the pen. As usual, Wacom continues to set the standard in this market.

Performance ★★★★★  
Features ★★★★★  
Configuration ★★★★★  
Compatibility ★★★★★  
Documentation/support ★★★★★

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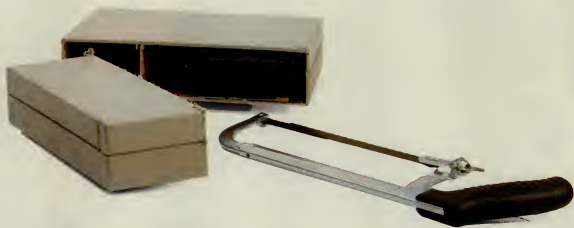
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# PRODUCT WATCH

- Buying info
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## UPS keeps Macs steady through ups and downs

Backup power supplies can save your Macs and data from the ravages of power disasters.

By Bob Weibel

Some strange things were happening to the new Macintosh IIsi at Architectural Reproduction in Portland, Ore. Occasionally, a drawing file would be saved and then be scrambled when opened again. On top of that, the Mac would automatically reset itself once in a while, dumping whatever work hadn't been saved. The problem? Power.

"We have a lot of problems with commercial power in this industrial area," said Monique Dolbow, office manager for the company. "The power lines are very old, and we have a lot of power fluctuations."

The installation of a \$299 AccuPower Model 20 uninterruptible power supply (UPS) from Liebert Corp. put an end to this nightmare.

Now, when the lights start flickering, or go out altogether, the Mac IIsi, monitor and Personal LaserWriter plugged into the company's AccuPower Model 20 keep right on ticking for up to 15 minutes, usually

enough time to ride out the trouble. "We never have to think about the UPS or the power problems, which is good sign," Dolbow said.

The AccuPower Model 20 is classified as an off-line (or standby) UPS, which is the most economical (see glossary, next page).

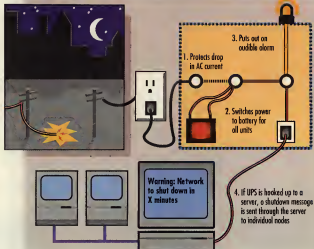
### A plethora of products.

According to experts, of the 100 or so UPS vendors, Liebert is one of the largest with a line of UPS products designed to serve a variety of systems, including desktops and mainframes. Smaller vendors are competing in the UPS business with both low prices and product innovation.

In most cases, vendors prefer that customers return the UPS for factory installation. However, the new LanGarde UPS models from EFI Electronics Corp. are the first to get a U.I. (Underwriters Laboratories Inc.) rating for safe and easy battery replacement. U.I. tests and certifies products for consumer safety.

Sam Morgan, principal of The Morgan Agency, an advertising and

### An uninterruptible power supply system in action



marketing company in Salt Lake City, is currently installing Efi LanGarde 600 UPSes for his six Macs and two laser printers.

"We definitely like the ease of battery replacement," Morgan said. "We've had good experience with Efi's surge protection products."

He said he also likes Efi's "Triple Crown" warranty, which covers the UPS and all connected equipment

for lightning, water damage and other hazards.

The LanGarde UPS is classified as line-interactive (see glossary, next page), generally more expensive but more capable than standby UPSes.

### Determining how much UPS you need.

Larger-capacity UPS systems have larger batteries and

See UPS, next page

### Network power backup at Northern Telecom: An electronic safety net

The data on your Macintosh LAN is probably worth several times the cost of your Mac servers and workstations.

When power goes down, open files on servers and workstations aren't properly updated, resulting in lost information and garbled files that are costly to repair. Plus, your business halts, costing up to thousands of dollars a minute.



Thénis Tzamaris, office automation specialist for Northern Telecom, uses UPS systems to keep his company's network up when the lights go down.

"Our Mac network is quite large, and we don't want any unscheduled downtime," said Thénis Tzamaris, office automation specialist for Northern Telecom in St. Laurent, Quebec. According to Tzamaris, placing uninterruptible power supply (UPS) systems on the company's Mac and Novell Inc. servers was only a partial protection.

"In addition to servers, all our network hubs and concentrators also have UPSes," he said. "Some workstations used for critical development work have UPS backup."

Tzamaris, along with the Local Networks team, has specified UPS power protection for all servers. Each Mac and Novell server in his division is set up with American Power Conversion Corp.'s Smart-UPS 1250VX standby UPS systems (see glossary, next page). The 1250VXes will run our Mac servers for several hours before they shut down," Tzamaris said.

"They've ridden through all blackouts to date, which was our aim in using the larger units," he said. Hubs and development machines get 20 minutes of backup power from APC Smart-UPS 400 and 370d units. Hubs and concentrators also get unlimited backup from emergency generators, according to Tzamaris.

When the power goes out in St. Laurent, Tzamaris and the Local Network team don't run around checking each AppleShare or Novell server to see how the batteries are

holding out. Instead, they count on APC's PowerChute software, an optional \$99 software package that can be installed on each server after a specified period of time.

Since each AppleShare server has a serial connection to its UPS, PowerChute detects the UPS status and, in turn, notifies AppleShare. Anyone logged onto the server is warned as the server approaches shutdown. Tzamaris specifies a specific shutdown time for each server. When the backup period has elapsed, PowerChute signals AppleShare to automatically save all files and close the server.

Currently, Tzamaris sees no need for remote maintenance or diagnostics of his division's UPS systems since most are centrally located.

To help managers of far-flung networks, several of the major UPS vendors, including American Power Conversion, have been meeting to discuss a standard approach to SNMP (Simple Network Management Protocol) that will allow network-management software to remotely manage UPS systems from different vendors.

Although that standard should be approved in late 1993, Tzamaris can upgrade his department's Smart-UPS systems with a \$799 SNMP adapter from American Power Conversion, which serves two Smart-UPS units. Managers can easily update that adapter's SNMP information when the UPS industry SNMP standard is finalized. — By Bob Weibel



## UPS

From previous page

heavier-duty circuitry. So, how powerful a UPS system should you buy?

Although the power consumption of most electronic devices is rated in watts, UPS systems are usually rated in volt-amperes (VA), which is the line voltage (typically 120 volts) multiplied by the amperes (electrical current) your Mac and peripherals draw. Here's one way to add up your power requirements:

► Examine the

back of your computer, monitor and external peripherals and look for an amperage rating on the name plate, such as "2A."

► Multiply the amps (2 amps in this example) by the voltage (120

volts) to obtain the total VA you need (2 amps x 120 volts = 240 VA, for example).

If you know only the wattage of your equipment, you can easily convert watts to VA units. For computer power supplies, some of the rated commercial power isn't usable, so wattage takes into account a "power factor," typically about 0.7.

► To convert watts to VA, divide the wattage by 0.7. A 200-watt CPU, for example, would rate about 285 VA.

► To convert a UPS VA rating to watts, multiply the VA rating by 0.7.

**Less is more.** Experts we spoke with maintained that CPU power consumption is typically overrated. "In actuality, the power requirements can be as little as half the official rating," said Marc Vernon, a product manager for the Tripp Lite Division of Tripp Manufacturing Co. Inc. Buying a higher-rated UPS gives you longer battery support (holdup time), so the extra

capacity isn't necessarily wasted, Vernon said.

"With a 200-VA load and [a UPS rated] at 250 VA you might have a five-minute holdup, at 400 VA you'd probably have 10 to 15 minutes, and 600 VA could hold you for 35 to 45 minutes," he said.

Ultimately, it's more a question of when — and not if — you should buy a UPS system. Considering the lost time and money power interruptions can cause your business, it's comforting to know that UPS power protection has never been cheaper or more convenient. □

Ultimately, it's a question of when — and not if — you should buy a UPS system.

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## Some UPS essentials: A guide to different types of power backup

Here's a quick primer on the different types of technology behind UPS systems.

Uninterruptible power supply systems come in three essential flavors: on-line, standby (off-line) or line-interactive.

Although vendors sometimes hype the relative merits of each, the issues are pretty straightforward. They mainly concern the speed with which an uninterruptible power supply (UPS) switches to backup power, the "decisions" of the power supplied and the way in which a UPS handles low-voltage (brownout) situations.



## ► On-line:

An on-line UPS is truly uninterruptible

because it's always supplying power from its battery, which is continuously recharged. No switching is required, hence there's no waiting for the battery to kick in when the commercial power at your wall socket fails.

Also, since an on-line UPS completely isolates you from public power, you get smooth, controlled alternating current (sine-wave quality).

► **Standby (off-line).** As its name implies, standby UPS systems pass regular commercial power to your computer but switch to battery power within milliseconds of detecting a power drop.

That transfer typically takes about two to five milliseconds, and power is interrupted during the transfer time. After transfer, the battery supplies power until it runs dry or commercial power resumes. When power resumes, the standby UPS again provides you with commercial power while it automatically recharges its batteries.

► **Line-interactive.** Strictly defined, a line-interactive UPS is a standby UPS with an output transformer that regulates the voltage level going out to your computer.

That power regulation is particularly useful in brownout situations by boosting power without tapping into the batteries. Some vendors also claim that since a line-interactive UPS keeps power to the UPS DC/AC inverter circuit, there's less of a transfer time than with standby systems, and the power is of sine-wave quality.

► **On-line vs. standby:** On-line UPS systems provide the pure, sine-wave-power quality and uninterruptible performance that make them the "best" UPSes available. But they may be overkill for Macs and other personal computers.

The central question is whether the two- to five-millisecond transfer time of standby UPSes will cause your Macintosh and its peripherals to lose data.



"Transfer times for standby systems have gotten down to two to three milliseconds on average," Vernon said. "Testing has shown that practically every personal computer out there can withstand 10 to 20 milliseconds of power interruption."

Bruce Stonely, UPS product manager for UPS vendor EFI Electronics Corp., agreed that on-line may be overkill for Macs. "I've rarely seen a microcomputer have a problem with standby

UPS transfer times," he said.

For Stonely, pure, sine-wave-quality voltage output is an emotional issue for some customers, but the "switched-mode" power supplies used on virtually all personal computers don't require that quality.

On the other hand, many mini- and main-frame computers and other devices with transformer-based linear power supplies do need the well-conditioned power provided by on-line UPS systems. On-line systems do run hotter and batteries wear out faster than standby or line-interactive.

► **Standby vs. line-interactive.** According to Tripp Lite's Vernon, "If you're in an area plagued by frequent brownouts, then a line-interactive system would be the best choice."

In a prolonged brownout, a standby system would switch to battery power and exhaust itself in 10 to 15 minutes, typically. EFI Electronics' Stonely said that EFI's line-interactive UPS systems will automatically boost commercial power that has dropped as low as 92 volts, without transferring to battery power. "That covers about 90 percent of the typical public utility-imposed brownouts," he said. — By Bob Whited

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## Apple enabler lacks luster in 32-bit part

Apple's patch for its '32-bit-dirty' ROMs is not necessarily a plug-and-play product. Here are some problems, plus work-arounds to help the transition.

### BUGS & TIPS

**Special needs.** Apple recently released its 32-bit System Enabler, a home-grown alternative to Connectix Corp.'s MODE32 extension for giving the SE/30, IIfx, Iix, and some Mac II machines access to more than 8 Mbytes of memory (see MacWEEK, March 1).

This long-awaited Apple patcher has proven to be less transparent, however, than the third-party option.

System 7.1 is the first version of the operating system that supports enablers, so you cannot use the 32-bit System Enabler with System 7.0 or 7.0.1. MODE32 is compatible with all versions of System 7, according to Connectix, despite earlier concerns about potential conflicts with virtual memory under System 7.1.

Apple's enabler must be placed

directly into the System folder and not into the Extensions or Control Panels subfolder—a factor that has created some confusion.

The start-up sequence also may be confusing. The Mac models for which MODE32 and the 32-bit System Enabler were created must start up in 24-bit mode because their ROMs are not "32-bit-clean" and Apple has never offered a ROM upgrade.

MODE32 and the 32-bit System Enabler create an artificial restart that switches the machine to 32-bit mode, making for a stuttering start, in which the happy-Mac icon appears twice.

For owners of the original Mac II, the enabler's requirement for IIfx ROMs is an issue. These ROMs (also used in the SE/30 and IIfx) are available only as part of Apple's high-density floppy drive upgrade,

about \$400. MODE32, by contrast, supports the original Mac II ROMs.

This requirement is not mentioned in the enabler's skimpy documentation file, but Apple's Customer Assistance Center confirmed it.

Using 32-bit addressing on the Mac II also requires a PMMU (paged memory management unit), unless the machine has a 68030 accelerator installed.

**Bugs, debuggers.** The 32-bit System Enabler, like other enablers, reportedly suffers from an operating system bug under System 7.1 that can cause crashes at unpredictable times. Connectix has released a free extension, Enabler Patch, that repairs the bug. The extension should be installed on any Mac that uses an enabler, until Apple fixes the problem in a future version of the operating system. (On ZiffNet/Mac, Connectix's Enabler Patch is file ENAPAT.SEA in Library 3 at location ZMC:DOWNTECH.)

This bug affects Adobe Type Manager, among other programs. Without the Connectix patch, ATM 2.x or 3.0 will freeze during start-up with the 32-bit System Enabler.

Suitcase, the popular utility from Fifth Generation Systems Inc., also has problems with enablers. Suitcase II 2.1.3 will address the issue.

Several people have reported compatibility problems between the 32-bit System Enabler and programming debuggers, including Apple's MacsBug. These problems do not occur with MODE32.

Electronic notes from Apple that accompany the 32-bit System Enabler mention a problem with using balloon help and the color-picker dialog at the same time, plus an incompatibility with SuperClock 3.9.

Lastly, there may be a problem with the 32-bit System Enabler's start-up process, in which hard disks are not unmounted properly during the switch from 24-bit to 32-bit mode. This could aggravate the disk-check problem covered here in recent weeks and also delay start-up, but I have not yet been able to confirm the problem.

**Making plans.** Switching to 32-bit mode on a Mac with 32-bit-clean ROMs is problematic enough. The additional glitches with the 32-bit System Enabler make a methodical approach even more important.

The first step should be an assessment of the benefits of 32-bit addressing. Its primary purpose is the support of RAM configurations larger than 8 Mbytes, and it may not be worth the trouble to use 32-bit addressing and virtual memory on machines with less RAM.

The second step, if 32-bit addressing is justified, is to make sure that the hardware and software configuration supports it.

### Ask David Ramsey

## Save As dialog box defaults

**Q.** I keep frequently using applications in the Apple Menu Items folder, which seems to make the Save As dialog box default to that folder. What can I do?



**A.** Ah, a lightweight question to start off the column! Put the real application elsewhere—presumably the folder to which you'd like the Save As dialog to default—and put an alias of the program in the Apple Menu Items folder.

**Q.** What performance difference is there between the built-in video of the newer Macs and an accelerated video card?

**A.** Newer Macs provide fast built-in video systems with dual-ported video RAM connected directly to the processor bus. The Centris machines and the Quadra 800 are especially fast because some QuickDraw routines have been optimized for their 68040 CPUs.

The reason built-in video is fast is that it doesn't have to deal with NuBus, a bottleneck that any video card (except one designed for a processor direct slot) must go through. An accelerated video card, with its separate processor, works with data stored in the card's RAM. Operations that involve moving a lot of pixels around the screen, such as scrolling, will be very fast on a card, but operations that move a lot of data across the NuBus, such as playing a QuickTime movie, won't benefit.

There are other considerations: If you want 24-bit video, you'll need a Quadra 700, 900 or 950, or a video card. Some cards, such as SuperMac Technology Inc.'s Thunder 24, are much faster than even a Quadra 800 and offer optional hardware for specific applications, such as Adobe Photoshop. The criteria are clear: Mac internal video for up to 16-bit color and QuickTime, and accelerated cards for 24-bit-color and special applications.

**Q.** Can I fool my PowerBook 180 into thinking it has 256 shades of gray? Some programs I have won't run in 16-gray mode.

**A.** You have some poorly designed programs, in my opinion. There's nothing you can do about this limit. There's no way to fool either the program or your PowerBook.

*Please send questions to David Ramsey on CompusServe: 76702,335 or to Ask David Ramsey, c/o MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105.*

Most important of all is the disk driver software, which must be 32-bit-clean from the very beginning to maintain the integrity of your data. Update the driver before switching on 32-bit addressing. Some NuBus or processor direct cards may need ROM updates for 32-bit addressing.

Once the configuration is ready for 32-bit addressing, Connectix suggests trying Apple's 32-bit System Enabler as a first choice. (I strongly recommend installing the Enabler

Patch along with the enabler.)

MODE32 may be a better first choice, however, because it lacks the problems of Apple's enabler, and it seems to have no disadvantages.

Please drop me a line or post a message in the MacWEEK Forum if you decide to enable 32-bit addressing on one of the pre-Ilx Mac models. I am especially interested in hearing about compatibility between accelerated Macs and the 32-bit System Enabler (or MODE32). □

Comments on MacInTouch are welcome at 7 Parmenter Ave., Maynard, Mass. 01754. Phone (508) 897-2621. Address electronic mail to RICFORD at AppleLink or MCI Mail; to 72511.44 on CompusServe; or on the Internet at 72511.44@compuserve.com. Join us on-line in the MacWEEK Forum at location ZMC:MACWEEK on CompusServe or ZiffNet/Mac.

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2.4 Gig Elite 5.25" 11ms, 5 Yr warranty	\$2898	\$2998
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RealTech 20" Hitachi Color	1,469	Hitachi							
D. RealTech 20" Trinitron Multi-Mode	1,895	Trinitron							
E. SuperMac 20" SuperMatch	1,499	Hitachi							
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F. NEC 17" SFC Color	\$1,589	Tohiba							
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G. RealTech 17" (RealTech Multi-Mode)	995	Hitachi							
H. Sony 17"	1,189	Trinitron							
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## Monitors



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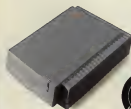


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Formatted Capacity	Speed	Size	Internal	External
ELS 42mb	19ms	3.5"TH	\$175	\$235
ELS 85mb	17ms	3.5"TH	\$199	\$259
ELS 127mb	17ms	3.5"TH	\$259	\$319
ELS 170mb	17ms	3.5"TH	\$299	\$359
LPS 105mb	10ms	3.5"TH	\$239	\$299
LPS 240mb	10ms	3.5"TH	\$399	\$459
LPS 525mb	10ms	3.5"TH	\$899	\$959
Pro 700mb	10ms	3.5"TH	\$1179	\$1239
Pro 1.05gb	10ms	3.5"HH	\$1339	\$1399
Pro 1.22gb	10ms	3.5"HH	\$1539	\$1599
*GO+80mb	16ms	2.5"PB	\$299	\$399
*GO+120mb	16ms	2.5"PB	\$399	\$499
*GO+160mb	16ms	2.5"PB	\$499	\$599

Two year Warranty. \*ONE year Warranty on GO drives.  
FWB™ HDT Formatting Software Included.

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All Syquest cartridges are  
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**Model**

External SyQuest 44mb (*One Cartridge Inc.)	<b>\$389</b>
External SyQuest 88mb (*One Cartridge Inc.)	<b>\$489</b>
External SyQuest 88mb C** (*One Cartridge Inc.)	<b>\$589</b>
Internal 44mb SyQuest (for Quadra 900&950)	<b>\$349</b>
Internal 88mb SyQuest (for Quadra 900&950)	<b>\$469</b>
Internal 88mb C SyQuest (for Quadra 900&950)	<b>\$559</b>
External SyQuest Dual 44mb (*One Cartridge Inc.)	<b>\$725</b>
External SyQuest Dual 88mb (*One Cartridge Inc.)	<b>\$895</b>
External SyQuest Dual 44/88mb (*One 44 & One 88 Cartridge)	<b>\$895</b>
External SyQuest Dual 88C mb (*One Cartridge Inc.)	<b>\$1075</b>
External SyQuest Dual 44/88C mb (*One 44 & One 88 Cartridge)	<b>\$999</b>
SyQuest 44mb Cartridge/10 Pack	<b>\$63/\$620</b>
SyQuest 88mb Cartridge/5 Pack	<b>\$97/\$480</b>

All SyQuest Drives come with FWB™ HDT Formatting Software. SyQuest  
carries a Two Year Warranty on Drives and One Year on Cartridges.

\* READS AND WRITES 44 AND 88 CARTRIDGES. Does not format 44 cartridges.

**TOSHIBA**

Formatted Capacity	Speed	Size	Internal	External
877mb	12.5ms	3.5"HH	\$1039	\$1099
1.23gb	12.5ms	3.5"HH	\$1399	\$1459
213mb <b>NEW!</b>	12ms	2.5"PB	\$649	\$749

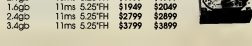
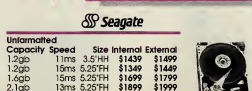
CD-ROM

600mb <b>NEW!</b>	200ms	3.5"HH	\$639	\$699
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Toshiba carries a THREE year Warranty on drives. ONE year Warranty on CD ROM. FWB HDT Formatting Software Included.



**CHECK US OUT!**



**MAGNETO OPTICAL DRIVES**

**TEAC**

Model	Speed	Size	External
128mb	45ms	3.5"HH	\$989
128mb cartridges (Tosoh)			\$39

**RICOH**

Model	Speed	Size	External
128mb	45ms	3.5"HH	\$1075
650mb	28ms	5.25"FH	\$2375
128mb/650mb Cartridge			\$39/95

**Maxtor®**

Model	Speed	Size	External
Tahiti II	35ms	1.0gb	\$3195
1.0gb Optical Glass Cartridge			\$225

All MO drives come with FWB HDT software.  
ONE MO cartridge and have a ONE year Warranty.

**TAPE BACK-UP DRIVES**

**ARDAT**

Model	External
2.0gb	\$1185
4.0gb - 8.0gb HC	\$1385
4.0gb - 8.0gb HC Turbo	\$1485
90m / 60m Tape	\$19/\$16

**TEAC**

Model	External
150mb Tape Backup Drive	\$485
600mb Tape Backup Drive	\$685
600mb / 150mb Tape Cassette	\$25/\$20

All tape backup drives come bundled with FREE  
Retrospect V.2.0. one tape and have a ONE year Warranty.

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**MICROPOLIS**

Formatted Capacity	Speed	Size	Internal	External
698mb	10ms	3.5"HH	\$1285	\$1345
1.05gb	10ms	3.5"HH	\$1635	\$1695
2.1gb	12ms	5.25"FH	\$2695	\$2795

Fast SCSI-2 Drives. FIVE year Warranty.  
FWB™ HDT Formatting Software Included.

**CONNER**

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Formatted Capacity	Speed	Size	Internal	External
85mb	17ms	3.5"TH	\$195	\$255
120mb	19ms	3.5"TH	\$255	\$315
170mb	13ms	3.5"TH	\$285	\$345
212mb	12ms	3.5"TH	\$365	\$425
540mb	12ms	3.5"HH	\$885	\$945
545mb <b>NEW!</b>	10ms	3.5"TH	\$899	\$959

Two year Warranty.  
FWB™ HDT Formatting Software Included.

**FUJITSU**

Formatted Capacity	Speed	Size	Internal	External
51.3mb <b>APRILL</b>	9ms	3.5"HH	\$699	\$959
1.07gb <b>NEW!</b>	9ms	3.5"HH	\$1739	\$1799
1.07gb	15ms	5.25"FH	\$1389	\$1489
1.75gb	15ms	5.25"FH	\$2289	\$2389
2.05gb	12ms	5.25"FH	\$2499	\$2599

FIVE year Warranty.  
FWB™ HDT Formatting Software Included.

**Maxtor®**

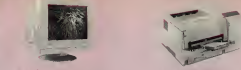
Formatted Capacity	Speed	Size	Internal	External
120mb	15ms	3.5"TH	\$239	\$299
213mb	15ms	3.5"TH	\$349	\$409
340mb	15ms	3.5"HH	\$599	\$659
535mb	12ms	3.5"HH	\$965	\$1015
540mb <b>NEW!</b>	9ms	3.5"HH	\$1055	\$1115
1.02gb <b>NEW!</b>	9ms	3.5"HH	\$1655	\$1715
1.24gb	13ms	5.25"FH	\$1375	\$1475
1.47gb	13ms	5.25"FH	\$1675	\$1775

Two year Warranty on 3.5" Drives and FIVE Years on 5.25" Drives. FWB™ HDT Formatting Software Included.



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MultiSync 3FGx - 15" Monitor	\$615
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FG8x 8-bit board	\$645
FG24x 24-bit board	\$1205
FG24x 24-bit board	\$1205
CD-Express	\$399
CD-ROM CDR-74	\$625
Multi-Media Gallery	\$805
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SilentWriter 95FX Printer	\$1855
SilentWriter 97F Printer	\$1755
SilentWriter 97FX Printer	\$2199
ColorMate P5-40 Color Printer	\$4399



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\*After \$250 CD-ROM in Package

NEC SilentWriter Model 951 Laser Printer  
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**\$1125\***  
\*After \$250 CD-ROM in Package

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## radius

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PrecisionColor 24XK Interface	\$839
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Rockets 33i	\$1949
RocketShare	\$419
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SuperMatch 21" Color Monitor	\$2499
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Two-Page 21" Platinum Monitor	\$999
SuperMatch 17T Color Trinitron Monitor	\$1099
Thunder/24	\$2349
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Spectrum 24/Series IV <b>NEW!</b>	\$849
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Spigot and Sound Pro	\$1179
Digital Film	\$4669

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1302 - 14" Color Multiscan	\$599
1430 - 14" Color Trinitron	\$669
1302LC - 14" Color Trinitron for LC	\$429
1604S - 16" Color Trinitron	\$1089

\*Includes MAC Adapter. Quadra compatible.

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Power Portrait 15" w/anti-glare	\$619
ColorMax 15"	\$739
ColorMax 20" - 20" Hitachi	\$1639
ColorMax 20T - 20" Trinitron	\$2049

## hp HEWLETT PACKARD

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Deskwriter 550-C	\$779
LaserJet 4M	\$1999

\*Prices include cable.



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PLPiS 1mb/8ppm/300dpi	\$1099
BLPi 2mb/4ppm/300dpi	\$1519
BLPiS 2mb/8ppm/300dpi	\$1769
BLPiS 4mb/8ppm/300dpi	\$2199
BLP Elite 2mb/4ppm/300dpi	\$1179
BLP Elite 2mb/8ppm/300dpi	\$1429
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MC3NB - Thick/Thin/10 Base T, 64k	\$199
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MC1ET4 - Thick/Thin/10 Base T, 64k	\$149
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\* We carry the full line of Asante Products.

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Turbo 040 33 Mhz	\$1369
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FastCache Turbo 33-128k cache	\$345
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FastCache Quadra (700, 900 & 950) - 128K	\$389
PowerCache 33MHz OR w/ FPU	\$385/\$475
PowerCache 40MHz OR w/ FPU	\$555/\$645
PowerCache 50MHz OR w/ FPU	\$735/\$865
PowerCache Adapters*	\$42

\* Additional on all PowerCache cards except for fli

## MAC SYSTEMS

Classic Color 4/80 <b>NEW!</b>	\$1429
LC III 4/80 - 4/160 <b>NEW!</b>	\$1299/\$1439
IVA 4/80 - 4/230 - 5/80 w/CD-ROM	\$1729/\$2059/\$2129
Centris 610 4/80 w/a Ethernet <b>NEW!</b>	\$1689
Centris 650 4/80 w/a Ethernet <b>NEW!</b>	\$2449
Quadra 950 8/0	\$4799
Quadra 800/230 <b>NEW!</b>	\$4049
Apple Adjustable Keyboard <b>NEW!</b>	\$219
Apple II 4/160 Color Monitor	\$529/\$1379
Color One Scanner <b>NEW!</b>	\$1299
StyleWriter II <b>NEW!</b>	\$339
Apple LaserWriter Pro 600/630	\$2009/\$2419
Apple LaserWriter III/IIIG	\$1779/\$2199

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All the extras for upgrading your Powerbook or Duo...	
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Radius PowerView for Powerbooks	\$499
External Battery Recharger for PowerBook	\$149
PowerPad/Sophisticated Circuits	\$79
PowerBook Battery	\$79
Auto Power Adapter	\$89
GCC Write/Move II Printer	\$499
AE ACCell Cellular Phone Interface	\$270
AE Datalink PB	\$473
AE Powerbook Auto Adapter	\$66

<b>Duos</b>	
Duo 210/230 Memory 4mb/8mb	\$295/\$545
Duo Floppy Adapter	\$135
HDI-20 Ext. 1.44mb Floppy Drive	\$199
Duo A/C Adapter	\$65
Duo Rechargeable Battery	\$46
Duo Dock	\$1079
Apple Mouse	\$79
<b>Carrying Cases:</b>	
1/0 Design Ultimate SL/EX - nylon	\$69/\$79
Check out our GO Drives in the Quantum Section!	

## MACINTOSH SIMMS

1x8/2x8/4x8/16x8 @ 80ns	\$31/\$61/\$125/\$525
<b>Quadra 700/950</b>	
4x8/16x8	\$125/\$525
<b>Powerbook 140/170</b>	
4mb/4mb/8mb	\$179/\$255/\$355
<b>Powerbook 160/180</b>	
4mb/6mb/8mb/10mb	\$225/\$295/\$395/\$445
<b>Duo 210/230</b>	
8mb/8mb	\$299/\$499
<b>PC 1x9/4x9</b>	\$39/\$139

## NEW MACINTOSH SIMMS \$CALL

## NEWLINE! TWINCOM

24/96 PowerWin - Internal for Powerbooks	\$131
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24/96 FaxNet - External	\$318
14.4 Pro - External	\$340
14.4 MacVoyager - Packet External	\$374
14.4 FaxNet - External	\$522
14.4 PowerTwin - External	\$568
Two year warranty.	

## NEWLINE! APPLE ENGINEERING

3.5 Mac Drive (External 800K)	\$211
3.5 Mac Drive (External 1.44)	\$225
QuadraLink (4 Port Serial for Mac IIs)	\$198
TransWarp IC - 25MHz or w/FPU	\$360/\$458
TransWarp IC - 33MHz or w/FPU	\$405/\$507
TransWarp IC - 40MHz or w/FPU	\$540/\$744
TransWarp IC - 50MHz or w/FPU	\$720/\$863
One year warranty.	

## NEWLINE! WACOM

6x9 Standard Tablet	\$462
12x12 Standard Tablet	\$660
12x12 ElectroStatic Tablet	\$726
12x18 Standard Tablet	\$990
12x18 ElectroStatic Tablet	\$1058

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## SPIN CYCLONE 3.5 OPTICAL DRIVE

We've accomplished two firsts. The first is that this is our first optical drive. The second first, even more exciting than the first (maybe we should have put the second first first), is that this is the first second-generation optical drive for under a thousand bucks. It uses ISO standard 128 MB 3.5 cartridges, so you can use them with other drives. And it comes with our premium Cyclone small-footprint, "brick" enclosure. Plus a two year warranty. So, you ask, "Should I try it first?" In a second.

**Cyclone 3.5 Optical Drive**  
Extra Cartridges: '95

**\$999**

## SPIN DOUBLE SPEED CD ROM DRIVE

If you guessed that by spinning a CD at twice the speed, the Toshiba XM 3401 drive mechanism inside this Spin CD ROM drive can access data twice as fast, that expensive college education isn't going to waste. In fact, it breaks the 200 msec access time barrier. And offers sustained transfer rates of 330 KB/sec. Other CD ROM drives are left with their jaws hanging wide open. This drive is your best choice if you're running QuickTime® movies, photo CD, or multimedia apps. Pretty smart.

**Spin Double Speed CD ROM Drive (External only)** **\$499**

## THE DEC DSP-3105 1-GIG DRIVE

Introducing the DEC DSP-3105 1-gigabyte drive. This Eddy award-winning monster moves like Ricochet Rabbit on double espresso. It's the world's fastest 3.5 inch drive. Thanks, in part, to a 5400 RPM spindle speed and a whopping 512K drive cache. With our minimum-footprint Cyclone® enclosure, and a great price, and 5-year warranty, no one can touch it for value. Says MacUser: "It's a dream drive."

<b>Cyclone enclosure</b>	<b>\$1799</b>
<b>Classic-style footprint enclosure</b>	<b>\$1749</b>
<b>Internal</b>	<b>\$1699</b>



## CYCLONE DAT DRIVES

If you're looking for DAT, you'll love dis. Cyclone DAT drives. They feature the zephyr-like Wang DAT drive mechanism - the industry standard for reliability. Our own Cyclone small-footprint chassis. And a price that won't dis you. Our standard Cyclone DAT drive has a 2.0 GB capacity. The compression model, up to 5 gigs. Both come with Dantz® Retrospect back-up software, and a 90-meter DAT tape, free. Dat's all you need.

<b>Cyclone Standard DAT</b>	<b>\$1199</b>
<b>Cyclone Compression DAT</b>	<b>\$1349</b>

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# A NEW SPIN LATEST TECHNOLOGY.



## SYQUEST 5110C 88/44 DRIVE

You want to upgrade your removable drive to 88 megs, but you've got a shelf full of old 44s staring you in the face. You have two options. One, use the old cartridges as coasters at geek cocktail parties. Or two, buy the new Spin Syquest 5110C drive that reads and writes both 44 and 88 meg cartridges. True, this drive does not format 44 MB cartridges, but we have a way around that - pre-formatted 44s.

Syquest 5110C 44/88 Drive	\$589
Syquest 88 MB Removable	\$489
Syquest 44 MB Removable	\$389
<b>Syquest Media</b>	
Unformatted 44 MB	\$61
Unformatted 88 MB	\$99
Formatted 44 MB	\$85
Formatted 88 MB	\$139



## ZERO FOOTPRINT DRIVES

We've gotten letters lately - mostly in crayon - from a few folks asking why we call these drives "zero footprint" when they obviously exist in three dimensions and take up space. We'd like to point out that when placed under your Plus or Classic or SE it takes up no more space than the computer already does. Zero. Neat trick, huh? Our sturdy zero-footprint drives feature a number of different mechanisms from makers like Conner, Quantum, Toshiba. Check the matrix below for the capacity you need. And please, put down that crayon.

Capacity (MB)	Model Number	Average Access Time (msec)	Transfer rate (K/sec)	MTBF (Hours)	Warranty (months)	Internal Drive Price	External Drive Price	Cyclone Drive Price
Conner								
85	CP-30080E	16	1300	150000	24	\$1109	\$269	
120	CP-30110	16	1300	150000	24	\$289	\$359	
170	CP-30170E	16	1400	150000	24	\$279	\$359	
213	CP-30200	15	2000	150000	24	\$349	\$419	
Quantum								
85	EL5 85S	17	1800	250000	24	\$199	\$269	
127	EL5 127S	17	1800	250000	24	\$269	\$339	
170	EL5 170S	17	3000	250000	24	\$299	\$369	
240	LPS 240S	16	2300	250000	24	\$399	\$469	
80 (Part4)	QES-80	17	1500	150000	12	\$249		
Toshiba								
210 MB (Part4)	MA-222A	12	1800	150000	12	\$549		
1.1 GB	MA-538	12	2800	250000	36	\$1149	\$1199	\$1249
DEC								
1.0GB	DSF-310S	9.5	3600	250000	60	\$1699	\$1749	\$1799
Seagate								
450MB	ST-3550N	12	3500	250000	36	\$849	\$899	\$949
1.0GB	ST-11200N	10.5	3200	200000	60	\$1199	\$1249	\$1299
Fujitsu								
530MB	MA-231FA	9	2700	200000	60	\$899	\$919	\$959
1.05 GB	MA-262FA	9	2800	200000	60	\$1349	\$1399	\$1449

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## 30 DAYS TO DECIDE.

If you're not satisfied, neither are we (we're referring, of course, to Macintosh peripherals only). That's why every Spin product comes with a 30-day money back guarantee. Test-drive any Spin product. Give it a real workout. If you're not happy, return it within 30 days for a refund. Was that good for you?

## MORE THAN JUST A LOW PRICE.

Filp through these pages (not right now, it's just a figure of speech), and you'll see a lot of low prices. The difference with Spin is that you get more. And not just a little more. We include many free things that others charge you for. Like a double-shielded SCSI cable. External terminator. A power supply designed for constant use. Not to mention our own Spin Disk Utilities with free upgrades for a year, system software, and unlimited tech support as long as you own a Spin drive. We aim to please. Call one of the other guys and ask what they'll give you for free. The cardboard box? The owner's manual? Then call us back.

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Go-Drive 2.5" Hard Drive (All Quantums - 2 year Warranty)

80 mb	17 ms	\$319	\$419
120 mb	17 ms	\$449	\$549
160 mb	17 ms	\$499	\$599

ELS Series (3.5" Low Profile and Low Power Drives)

42 mb	19 ms	\$175	\$229
85 mb	17 ms	\$214	\$268
127 mb	17 ms	\$289	\$339
170 mb	17 ms	\$309	\$369

LPS Series (3.5" Low Profile and Low Power Drives)

240 mb	10 ms	\$439	\$479
525 mb	10 ms	\$919	\$979

Prodrive Series (3.5" Half Height Drives)

700 mb	10 ms	\$1179	\$1239
1.0 Gb	10 ms	\$1339	\$1399
1.2 Gb	10 ms	\$1548	\$1579

### SEAGATE

3.5" Half Height Drives (1 year Warranty)

1.2 Gb	10 ms	\$1489	\$1549
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Wren and Elite Series (5.25" Full Height Drives)

Wren 7 1/2 Gb	15 ms	\$1369	\$1475
Wren 8 1/6 Gb	15 ms	\$1709	\$1809
Wren 9 2 1/4 Gb	12.5 ms	\$1929	\$2029
Elite 1 1/6 Gb	11.5 ms	\$1989	\$2089
Elite 2 2/4 Gb	11 ms	\$2868	\$2968
Elite 3 3/4 Gb	11 ms	\$3909	\$4009

### TOSHIBA

3.5" & 2.5" Disk Drives (2 year Warranty)

2.5" 213 mb	12 ms	\$678	\$778
3.5" 830 mb	12 ms	\$1029	\$1089
3.5" 1.2 Gb	12 ms	\$1389	\$1489

### CONNER

3.5" Disk Drives (2 year Warranty)

42 mb LPS	17 ms	\$178	\$228
85 mb LPS	17 ms	\$198	\$248
120 mb LPS	12 ms	\$258	\$308
170 mb LPS	12 ms	\$279	\$338
212 mb LPS	9 ms	\$358	\$419
540 mb	8.5 ms	\$889	\$948

### FUJITSU

3.5" & 5.25" Disk Drives (5 year Warranty)

3.5" 330 mb	9 ms	\$838	\$888
3.5" 520 mb	9 ms	\$878	\$958
3.5" 1.1 Gb	8.5 ms	\$1589	\$1609
5.25" 1.2 Gb	11.5 ms	\$1289	\$1458
5.25" 2.06 Gb	11.5 ms	\$2119	\$2219
5.25" 2.4 Gb	11.5 ms	\$2448	\$2548

## Scanners

### MICROTEK

Model Price

Includes free software	
Scannemaker II - Color w/free Photoshop LE	\$948
Scannemaker IIIE - Color w/free Photoshop	\$1248

### UMAX

Includes free software

UC630 - Color w/free Photoshop	\$1078
UC12003 - Color w/free Photoshop	\$2948
UC840 - Color w/free Photoshop	\$1248
Transparency Unit	\$698
Auto Document feeder	\$398
UC600 - Greyscale w/free Typewriter OCR, OFOTO & Publish It	\$848

## Accelerators

### DAYSTAR DIGITAL

Model Without CPU With CPU

33 MHz Powercache	\$379	\$475
40 MHz Powercache	\$549	\$645
50 MHz Powercache	\$719	\$859
Powercache Adapter	\$40	
Equalizer LC	\$169	\$239
Fast Cache IISI	\$279	\$349
Fast Cache IId	\$215	
Fast Cache Quadra	\$259	
Fast Cache Q 950	\$399	
33 MHz Turbo 040	\$1429	
Fast Cache Turbo 33-12	\$339	

## Modems

### PROMETHEUS

Model Price

Ultima Home Office ext 14.4/14.4SR Fax w/ V.42 bis & voice	\$398
Promodem 144 Internal for Powerbook 14.4/14.4SR Fax w/ V.42 & V.42 bis	\$278
Promodem 144e ext 14.4/9600 Fax w/ V.42 & V.42 bis	\$278
Promodem 24e ext 24/9600 Fax w/ V.42 & V.42 bis	\$128
Promodem Mini 2400 2400 BPS mini, data only	\$79

## ZOOM TELEPHONICS

All units come with Microphone LT Software

Price

Faxmodem P8K for Internal Powerbook 96/48 SR Fax w/2400 BPS Modem	\$99
Faxmodem PKT Portable 96/48 SR Fax w/2400 BPS Modem	\$109
Faxmodem FXV V42 bis/MNP5/2400 BPS 96/96 SR Fax	\$149
Faxmodem FXV.32 V.32 bis, 14.4 data & fax, V.42 bis/MNP5	\$279

## SyQuest

Unformatted Capacity	Access Time	Price
Includes one free cartridge (2 year Warranty)		
44 mb External	19 ms	\$398
88 mb External	19 ms	\$489
88C mb External	19 ms	\$589

## Opticals

Includes one free disc (1 year Warranty)		
128 mb Panasonic Optical	39 ms	\$998
128 mb Epson Optical	29 ms	\$1078
256 mb Most Optical	31 ms	\$1698

## DAT Drives

Unformatted Capacity	With DQ0 backup	With Perspective
Includes one free DAT Tape & your choice of DQ0 Backup or Perspective		
WangTek 2.1 Gb	\$998	\$1098
WangDat 5.0 Gb	\$1348	\$1448

## Accessories

Powerbook cable	\$30
3 Ft. 50/50 cable	\$15
6 Ft. 50/50 cable	\$25
Half High Cab w/ AC outlets	\$90
Full High Cab w/ AC outlets	\$125
Half High Cab w/o AC outlets	\$80
MicroCab	\$90

## Media

Model	QTY 1	SPK	10PK	Model	QTY 1	SPK	10PK
5yQ44 cart	\$72	\$67	\$65	5yQ88 cart	\$119	\$104	\$99
128mb OPT	\$54	\$44	\$39	256mb OPT	\$88	\$84	\$79
96mm DAT	\$20	\$16	\$14	90mm DAT	\$25	\$19	\$17

## Memory

Model	60 NS	70 NS	80 NS	Model	60 NS	70 NS	80 NS
4x8	Call	\$33	Call	2x8	Call	\$63	Call
4x8	Call	\$133	Call	8x8	Call	Call	\$279
16x8 FX	Call	\$549	Call	16x8 Q950	Call	Call	\$515
P8140/170 2mb module	\$95			P8160/180 4mb module	\$205		
P8140/170 4mb module	\$169			P8160/180 6mb module	\$279		
P8140/170 6mb module	\$225			P8160/180 8mb module	\$369		
256 Q950 VRAM	\$28			P8160/180 10mb module	\$429		
256 Q700/900 VRAM	\$28			512K VRAM IIVX,LC	\$49		

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Visa, Mastercard, Amex, CDO, Telecheck Accepted. Credits, Gov. Corp., Univ., P.O.s will come. All new drives, preformatted with Microsoft system software. Factory warranty. Broker, cables and software included. In 30 Days. Money Back Guarantee covers drive prob. only. Return Authorization number required for returns. Prices, terms and availability subject to change without notice.

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# Outrageous Speed

## APS Maxtor I240, \$1699

Need a high capacity drive with benchmark-shattering performance? Then the new APS Maxtor I240 is the drive for you. With transfer rates topping 4MB per second, incredible 8.2ms seek times, a 500,000 hr MTBF, three-year warranty and APS's legendary support, this *the* drive of choice with your Quadra or fx for that high-capacity, high performance storage need.



External  
Maxtor I240  
**\$1799**



### Quantum MW

MB	INTL	EXTL
240	\$399	\$479
525	959	1029
1225 <sup>1</sup>	1499	1569

<sup>1</sup>5-year warranty

### Quantum MW

ELS Low Profile Drives

MB	INTL	EXTL
42	\$159	\$219
85	199	269
127	279	349
170	299	359

### Maxtor MB

MB	INTL	EXTL
120 <sup>2</sup>	\$229	\$309
213 <sup>1</sup>	349	409
340 <sup>2</sup>	599	669
540 <sup>3</sup>	1099	1199
1240 <sup>3</sup>	1699	1799
1.2G <sup>2</sup>	1499	1599
1.7G <sup>2</sup>	1799	1899

<sup>2</sup>3-year warranty <sup>1</sup>1-year warranty <sup>3</sup>5-year warranty

### APS SCSI Boy \$29



• The Ultimate PowerBook Accessory  
• Fastest Data Transfer Rate  
• PowerBook SCSI Adapter  
• Carry Your Own Cable  
• Never Get Caught with the Wrong Cable Again  
• Shock-Resistant Housing

### Micropolis MB

MB	INTL	EXTL
560	\$1099	\$1199
1.1G	1649	1729
2.0G	2699	2799

Includes 5-year warranty

### Quantum MB

PowerBook GoDrives

MB	INTL	EXTL
80GRS	\$349	\$499 <sup>1</sup>
120	399	529 <sup>1</sup>
160GRS	549	679 <sup>1</sup>

(Battery-powered Companion Case for the PowerBook)

### Fujitsu MW

MB	INTL	EXTL
520	\$949	\$1049
1.2G 5.25"	1399	1499
1.2G 3.5"	1799	1899
2.0G	2299	2399

Includes 5-year warranty



APS PowerBook Companion Cases  
The Perfect Home for Your Original PowerBook Drive

AC only	\$79
AC/DC (Battery-Powered)	169

# APS Technologies



# The Fastest DAT Ever!

## APS Turbo DAT, \$1599

The APS Compression DAT rated the MacWorld Editor's Choice for high capacity backup. Now, get even better performance with the APS Turbo DAT. Based on Archive's Turbo Python DAT Mechanism, the fastest DAT unit available, the APS Turbo DAT is more than 20% faster than all other DAT units. With a two-year warranty and 80,000 hr MTBF you'll probably never need APS's legendary support.



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Quadas  
**\$1499**

30-Day  
Money-Back  
Guarantee

Unlimited  
Toll-Free  
Technical  
Support

Disk-For-Disk  
Replacement  
Warranty

### Toshiba

MB	INTL	EXTL
213	\$669	\$799*
1.2G	\$1399	\$1499

Battery-powered Compaq's Case for the PowerBook

CD-ROM  
3401-E1 \$699 \$749\*

Fastest CD-ROM Drive Available  
Double Speed, Multi-Session Photo CD Compatible  
\*Includes Four-Disc APS CD Bundle

### APS Modems \$69 for PowerBooks

2400 baud (9600 send fax/4800 receive fax)



9600 baud v.32 \$279  
14,400 baud v.32 bis \$349

All APS Modems for the PowerBook include a 30-day MBG, comprehensive installation guide, and APS's Communications & Fax software.

### SyQuest

Model	INTL	EXTL
SQ555	\$349	\$389
SQ5110	469	489
SQ5110c	569	599

The SQ555 reads & writes 44.6 MB cards!  
SyQuest Cartridges 44/108 85/100  
Performance Cartridges 44/108 370/105

### TEAC

155 MB Tape Back Up	\$499
600 MB Tape Back Up	\$799

All APS Tape Drives Include Retrospect by Dantz

### DAT

Model	INTL	EXTL
APS TurboDAT	\$1499	\$1599
APSDAT	1099	1199

\*Internal models for Quadra 950 & 950  
All APS DAT Drives Include Retrospect by Dantz

### 128MB MO

Model	INTL	EXTL
Epson	\$1099	\$1199
128MB Magneto Optical Drive		

24-Hour  
BBS with  
Our Latest  
Software

Bright,  
Knowledgeable  
Sales  
Associates

\*30-day money back guarantee: All drive products carry a 30-day money back guarantee. Your risk is the purchase price of the drive.  
\*Disk file disk replacement warranty: SyQuest, most Quantum, Maxtor and QIC drives are warranted for 3 years. PowerLite, 1.2GB and 1.44GB drives are warranted for 5 years. QIC80, Quantum 1.2GB, 1.44GB, and all QIC80, 1.2GB and Quantum units are warranted for 5 years. Toshiba 800 is warranted for 3 years.  
\*PowerLite and Quantum units are warranted for 3 years. Retrospect software is subject to existing license.

\*All our hard drives include brackets, cables, cords and SCSI required for operation with the specified hardware. All hard drives have 80% technology performance with Apple's Proton 2.0 software or at least 1.7MB/s compared to publicly distributed software, and APS Technologies ALLAPC POWERTOOLS SCSI format and disk partitioning software.  
\*Toll-free technical support as often as for as long as you need. Regular hours are 9am-5pm Monday through Friday, 9am-5pm Saturday, 9am-12pm Sunday.

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# Quantum

**NEW  
LOWER PRICES**



Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
<b>GO*DRIVE (2.5" HARD DRIVES DESIGNED FOR NOTEBOOKS)</b>					
80mb	GO80	17ms	80mb	\$299	\$399
120mb	GO120	17ms	120mb	\$389	\$489
<b>ELS SERIES (3.5" LOW PROFILE AND LOW POWER)</b>					
42mb	ELS42	19ms	40mb	\$175	\$235
85mb	ELS85	17ms	82mb	\$199	\$259
127mb	ELS127	17ms	124mb	\$269	\$329
170mb	ELS170	17ms	160mb	\$299	\$359
<b>LPS SERIES (3.5" LOW PROFILE)</b>					
105mb	LPS105	11ms	100mb	\$255	\$315
240mb	LPS240	10ms	234mb	\$369	\$429
525mb	LPS525	10ms	500mb	\$909	\$969
<b>PRODRIVE SERIES (3.5" HALF HEIGHT)</b>					
425mb	PRO425	9ms	406mb	\$879	\$939
700mb	PRO700	10ms	670mb	\$1195	\$1255
1.0GIG	PRO1050	10ms	1001mb	\$1339	\$1399
1.2GIG	PRO1225	10ms	1165mb	\$1495	\$1555

GO\*Drives carry a ONE Year Warranty. ELS drives, LPS drives, PRO drives carry a TWO Year Warranty.

## FEATURING



**SyQuest®  
REMOVABLE  
TECHNOLOGY**

<b>ClubMac BB® REMOVABLES</b>		
ClubMac 88c External (SQ5110C)		\$579
ClubMac 88c Internal		\$559
ClubMac 88c Dual		\$1045
<b>ClubMac 44mb REMOVABLES</b>		
ClubMac 44mb External (SQ555)		\$385
ClubMac 44mb Internal		\$345
ClubMac 44mb Dual		\$695
<b>ClubMac 88mb REMOVABLES</b>		
ClubMac 88mb External (SQ5110)		\$489
ClubMac 88mb Internal		\$469
ClubMac 88mb Dual		\$875
<b>SyQUEST CARTRIDGES</b>		
44mb Cartridge		\$63
88mb Cartridge		\$97

\*SyQuest Drives include TWO Year Warranty, one cartridge and necessary cables. SQ5110C is a Formatted drive. SQ5110C is a Formatted drive. SQ5110C is a Formatted drive.

# Seagate

## FEATURING...THE ELITE DRIVES

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
<b>9.5" DESK DRIVES</b>						
248mb	ST3283N	Low Profile	12ms	235mb	\$479	\$539
1.2GIG	ST1203N	Half Height	10.5ms	1000mb	\$1369	\$1429
<b>When and Elite Series (5.25" Full Height)</b>						
645mb	ST4767N	When Runner II	11.8ms	634mb	\$1519	\$1619
1.2GIG	ST4712N	When-7	15ms	988mb	\$1249	\$1349
1.6GIG	ST41651N	When-8	15ms	1350mb	\$1679	\$1779
2.1GIG	ST42100N	When-9	12.9ms	1900mb	\$1869	\$1969
1.6GIG	ST41600N	Elite-1	11.5ms	1307mb	\$1839	\$1939
2.4GIG	ST42400N	Elite-2	11ms	2050mb	\$2539	\$2639
3.4GIG	ST43400N	Elite-3	11ms	2750mb	\$3419	\$3519

Seagate drives carry a ONE Year Warranty.

# Maxtor

Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
<b>XT SERIES (3.5" LOW PROFILE)</b>					
120mb	7120S	15ms	121mb	\$225	\$285
207mb	7213S	15ms	202mb	\$339	\$399
<b>LXT &amp; MXT SERIES (3.5" HALF HEIGHT)</b>					
330mb	LXT-340	15ms	324mb	\$589	\$649
535mb*	MXT-535	8.5ms	521mb	\$975	\$1035
1240mb*	MXT-1240	8.5ms	1150mb	\$1599	\$1659
<b>PANTHER SERIES (5.25" FULL HEIGHT)</b>					
1.2GIG	P1-12S	13ms	997mb	\$1295	\$1395
1.7GIG	P1-17S	143ms	1430mb	\$1595	\$1695

Master 3.5" drives carry a ONE Year Warranty. Master 5.25" drives carry a TWO Year Warranty.

# CONNER

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
85mb	CP3080E	3.5" Low Profile	17ms	82mb	\$199	\$259
110mb	CP30170E	3.5" Low Profile	17ms	106mb	\$285	\$345
172mb	CP30200	3.5" Low Profile	12ms	206mb	\$369	\$429
540mb	CP30540	3.5" Half Height	10ms	515mb	\$899	\$959

Conner drives carry a ONE Year Warranty.

**FIVE YEAR WARRANTY**

# FUJITSU

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
425mb	M2623FA	3.5" Half Height	9ms	405mb	\$895	\$955
520mb	M2624FA	3.5" Half Height	9ms	496mb	\$945	\$1005
1.1GIG	M2684	3.5" Half Height	8.5ms	995mb	\$1695	\$1755
1.2GIG	M2686	5.25" Full Height	14.5ms	1029mb	\$1375	\$1475
2.0GIG	M2682	5.25" Full Height	14.5ms	1865mb	\$2295	\$2395
2.4GIG	M2684	5.25" Full Height	11.5ms	2000mb	\$2499	\$2599

**FIVE YEAR WARRANTY**

# HEWLETT PACKARD

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
<b>3.5" HALF HEIGHT DRIVES</b>						
234mb	C2233		12.6ms	223mb	\$799	\$859
422mb	C2235		12.6ms	402mb	\$1049	\$1109
1.2GIG	C2247		10.5ms	1000mb	\$1599	\$1659
<b>5.25" FULL HEIGHT DRIVES</b>						
677mb	97556		13.5ms	833mb	\$1465	\$1565
1.2GIG	97558		13.5ms	1020mb	\$1665	\$1765
1.6GIG	97560		13.5ms	1282mb	\$1995	\$2095
2.4GIG	CP3010		11.5ms	2000mb	\$2969	\$3069

Hewlett-Packard drives carry a ONE Year Warranty.

## ClubMac TAPE BACKUP SYSTEMS

Capacity	Model	Description	Media	Internal	External
155mb	Teac MT25T/N50	Analog	CT6000	\$429	\$449
600mb	Teac MT25T/F50	Analog	CT600F	\$629	\$649
250mb	Archive Viper 250	Analog	DL6250	\$479	\$499
500mb	Archive Viper 500	Analog	DL6250	\$709	\$729
2.0GIG	Archive Python	DAT, DDS	4mm	\$1129	\$1149
3.6GIG	Archive Turbo DAT	DAT, DDS DC	4mm	\$1339	\$1359
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1329	\$1349
3.6GIG	HP 35480A	DAT, DDS-DC	4mm	\$1529	\$1549
2.0GIG	Exabyte EXB-8000	Digital/Helical	8mm	\$1869	\$1889
2.0GIG	Exabyte EXB-8500	Digital/Helical	8mm	\$2049	\$2069

Includes Spectra v2 Bc Backup Software. One Year and ONE Year Warranty.

## ClubMac OPTICAL DRIVES

Model	Capacity	Description	Seek	External
CMO-OD3000	Teac	128mb	3.5" Half Height	\$389
CMO-LF3004	Panasonic	128mb	3.5" Half Height	\$1129
CMO-3100E	Ricoh	128mb	3.5" Half Height	\$1075
CMO-5031E	Ricoh	594/652mb	3.5" Half Height	\$2345
CMO-JV-750	Sharp	594/652mb	5.25" Half Height	\$2295
CMO-Tahiti II	MaxOptix	650cm <sup>3</sup> /1.0GIG	3.5" Half Height	\$3195
128mb Cartridge		3.5" Single Sided		\$39
594/652mb Cartridge		5.25" 512/1024 bytes/sec		\$99

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.



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## STORAGE!

64MB REMOVABLE

**Procom 44 MB Removable** with cartridge  
See below for complete line of storage products



**\$469**

## MAGNAVOX

A Philips Company



**MagnaVox 14" Color** for all Macs  
14" display with 24-bit color card \$829

**\$399**

## UMAX®

### 800 DPI



**Umax UC840 Color Scanner** with Photoshop  
(shown with optional transparency unit)

**\$1345**

## Macintosh



**Mac LC III 440** (price is for CPU only)  
LC III with 14" color display & keyboard **\$1645**

**\$1099**

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**Procom CD-Station Super** for 2000s  
access time CD-ROM includes 7 popular  
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Procom Technology manufactures high performance, high quality computer storage devices. All Procom products are fully formatted, tested and backed by 1-5 year warranties along with Mac/Novell on 30 day MBE. Call for access info.

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4 MB SIMM, 70ns 124  
16 MB SIMM, 70ns 569  
8 MB SIMM, 70ns (18000:160) 369  
Memory warranty on all SIMMs  
Due to federal recall, stock prices may change significantly. Call for latest prices

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Neugen 400dpi/600dpi 1649/1895  
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Refills for Apple, Canon, HP Ink Jet  
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## Displays & Cards



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Multi-Sync  
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menu scroll

**\$2,195**

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8 bit & 24 bit Accelerated Color Cards  
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Apple 12" 114" 399/569  
Sony 1304/1604 Call/1095  
Sanyo 1465 14" Trinitron Call  
Sanyo 20" Trinitron Call  
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E-Machines Color Cards  
E-Machines PowerLink Presenter 499

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**Cards**  
For Mac Plus, Classic SE,  
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**Call**

8 bit card for SE/30, IIx & Quadra  
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LC-Type Ix LC's w/only TV  
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Call for New Pricing and  
Let us help you pick the right card!

## radius



**NEW Precision Color Photo**  
15" Portrait Landscape  
Compatible with Quadra & Centris on-board video

**\$929**

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Radius 2000/2000/2000 495/779/949  
VideoView with Premier 1899  
Radius Rocker/RockerShare Call

## SIGMA DESIGNS



**Trinitron**  
Sigma Designs 17" Trinitron  
Multi-Sync  
Trinitron display

**\$1245**

PowerPortrait 15" display (for SCSD) Call  
Paper/Thin gray scale 15" display 499  
21" Silver View Pro (mono) SC 1099

## Snooper

FREE View & Monitor



**Snooper Special - White SupraScan**  
20 Software with View & Monitor 169  
20 NitBus Kit with View & Monitor 149

**\$109**

## Scanners

Umax UC800 600dpi with Photoshop 1095  
Tamaack Artisan 600C w/ Photoshop 999  
Tamaack Artisan 800C w/ Photoshop 1295  
Tamaack Artisan 1200C 1995  
24 bit True optical 1200 dpi, with Photoshop

## MICROTEK

NEW Microtek ScanMaker Ite 859  
1200 dpi, 24 bit color with Photoshop LE  
NEW Microtek ScanMaker Ite 1099  
1200 dpi, 24 bit color with full Photoshop  
Transparency Option for II & Ix  
Microtek ScanMaker 1850S Call  
1850dpi, 24 bit color, dual camera, Photoshop  
ASK ABOUT \$75 MICROTEK REBATES

## Kai's POWER TOOL®

for Adobe Photoshop  
HSC Kai's Power Tools 859  
"Amazingly powerful, yet easy to use plug-in filters for Photoshop. If you use Photoshop you'll use this product." Publish Magazine 5-star scanner.  
Call for SPECIAL PRICE with SCANNER!



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Now you can connect 3 total devices to your Mac **\$99**

## Macs

Mac LC III 440 1245  
Mac Ix, 4/0 1395  
Centris 610/620 NEW  
Quadra 640/620 3995  
Quadra 650 4/0 4795  
PowerBooks 160, 180 & Duo Call

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128k, copy back cache card speeds up the Quadra  
700, 900 & 950 fast made up to 25%  
QuadraCache 25 for 700 & 900 269  
QuadraCache 25 for 950 349

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Dayna  
Dayna EtherPrint  
EtherNet connection for printers

**\$329**

Ethernet interfaces in this or 10Base T  
DaynaVibe, Mac II family, Ix 149  
DaynaVibe, Mac SE/30, LC, LC II 149  
Mac IIx/IIx Plus II 299/79  
Path/Finder Router 629  
SCSI Link 269  
Let us help you pick the right interface!

## Modems

Hayes Actus 24 modem 74  
Hayes Actus 9606 fax modem 249  
Hayes Actus 144 fax modem 299

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SupraFax Modem V.32 249  
SupraFax Modem V.32 144 339

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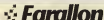
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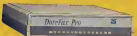
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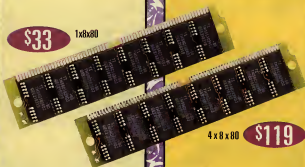


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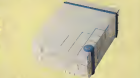
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MAC CLASSIC	+						+										
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CLASSIC/40 MHZ	WITHOUT ACCELERATOR	WITH ACCELERATOR		
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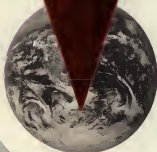
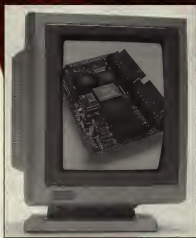
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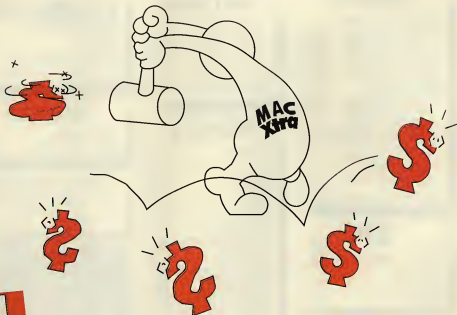


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## Servers

From Page 1

AppleShare 3.0 on a stock Quadra 950, Apple said. The PDS card provides two SCSI direct memory access (DMA) channels and a secondary cache with up to 512 Kbytes of RAM, while the A/UX operating system delivers multithreaded, multitasking capabilities, including asynchronous I/O. Each user session will be treated as a separate process by the computer, which should cut down the wait before the server responds to user requests.

AppleShare Pro will provide services for 200 concurrent users and handle up to 50 simultaneous user requests. It will be fully compatible with existing System 7 AppleShare client software, the company said.

Prices for the AWS 95 will range from \$7,589 to \$12,929, depending on configuration (see chart).

The other two systems in the new ESD lineup, slated to ship in June, are intended for smaller workgroups. The AWS 80, based on an unmodified Quadra 800, will be at \$6,399. The AWS 60, based on a Centris 610 and designed particularly for the K-12 market, will sell for as little as \$3,079.

Both will run AppleShare 4.0, an improved version of Apple's file and print server software for the Mac operating system. The AWS 60 will offer about twice the performance of AppleShare 3.0.1, while the AWS 80 will triple performance, according to the company.

AppleShare 4.0 will support up to 150 concurrent users, although only

## Apple Workgroup Servers

MODEL	RAM	HARD DISK	DATA	RAM CACHE	PRICE
AWS 60	8 MB	230 MB	No	n/a	\$3,079
AWS 60	8 MB	500 MB	No	n/a	\$4,099
AWS 80	8 MB	500 MB	No	n/a	\$6,399
AWS 80	8 MB	500 MB	Yes	n/a	\$8,219
AWS 80	16 MB	1,000 MB	Yes	n/a	\$9,539
AWS 80 + CD	16 MB	1,000 MB	Yes	n/a	\$9,539
AWS 95	16 MB	230 MB	No	128 K	\$7,589
AWS 95	16 MB	500 MB	Yes	256 K	\$10,029
AWS 95	32 MB	1,000 MB	Yes	512 K	\$12,839
AWS 95	32 MB	230 & 500 MB	Yes	256 K	\$11,319
AWS 95	48 MB	230 & 1,000 MB	Yes	512 K	\$12,929

30 can be active at any one time, Apple said. Because AppleShare 4.0 runs only on 1040-based Macs, Apple will continue to offer but not further enhance Version 3.0, which is priced at \$1,199.

The top-of-the-line AWS 95 is intended as a platform for third-party services as well. Among them:

- **Retrospect.** Apple will handle a four-user pack of Retrospect Remote A/UX, a new unit version of Dantz Development Corp.'s backup application, with the high-end server.

- **Oracle.** Users will be able to run a special version of Oracle Corp.'s Oracle7 database in lieu of AppleShare Pro on the AWS 95.

Oracle said the software should be available in May. Pricing isn't final but should be comparable to the \$625-per-user price it charges for other desktop Unix versions.

- **4D.** ACT!US Inc. of Cupertino, Calif., reportedly will offer a version of its 4D Server for the Apple servers. ACT!US said the new version of 4D Server will ship this summer. Upgrades will be free.

- **Groupware.** Apple said Meeting Maker from ON Technology Inc. of Cambridge, Mass., and QuickMail 2.6 from CE Software Inc. of West Des Moines, Iowa, are compatible with the new servers.

Current Quadra 900 and 950 owners will be able to purchase an AWS 95 PDS card upgrade for \$2,499. A kit consisting of the PDS card, a Hewlett-Packard Co. digital audio tape drive with on-board compression and Retrospect Remote will sell for \$4,399.

AppleShare Pro will be available separately for \$2,399 in April. AppleShare 4.0 will sell separately for \$1,899.

Server options include a DAT drive based on an HP mechanism with on-board compression. □

## Market

From Page 1

new machines, analysts said.

"This is a very reasonable first effort in the server arena — it's a first pass that satisfies the installed base," said Charles Wolf, an analyst with First Boston Corp. in New York. "I anticipate that the next step will address the need for more effective support for cross-platform environments."

Kinball Brown, vice president of microsystems hardware for InfoCorp, a market research company in Santa Clara, Calif., said: "There is an installed base crying for a Mac server, especially in shops that are 75 percent or more Macintosh. From the PC side, however, this is an inferior system."

At press briefings last week, Apple did not lay claim to the cross-platform network market, saying that it would provide more DOS and Windows support in future products. For now, the company will support IBM PCs and compatibles with an Apple-licensed version of Farallon Computing Inc.'s PhoneNET PC, which will be marketed as AppleTalk Connection for DOS and Windows.

But that may not be enough for heterogeneous networks, said William Green, network manager for the University of Texas at Austin. "AppleTalk is not really scalable," he said. "These servers will be useful in some situations, but it's certainly not an enterprise solution."

InfoCorp's Brown said that without robust support for PCs and compatibles, "you'd have to be an idiot to buy this stuff instead of a second- or third-tier Intel machine with [Novell Inc.'s] NetWare."

Apple's pricing also drew criticism from Brown. "When Apple charges [for Computer Group] and IBM, which were charging ridiculous prices two years ago, it might have had a pretty good argument. Today [the servers] just

don't match up to the cost of a PC server."

Joe Prinz, network manager at Racine, Wis.-based Design North, said his company switched to NetWare servers years ago. "With NetWare, the server gets completely excellent performance, and it's reliable," he said. "I can't see any reason to go [back to AppleShare]." He said he is envious of Mac managers only because of the AppleShare interface's ease of use.

Users and analysts also noted the absence of DOS and Windows clients for Dantz Development Corp.'s Retrospect Remote, the backup application handled with the AWS 95.

Doug McLean, ESD product manager for network servers and services, last week explained Apple's performance goal for the new servers: "If users believe the server is responding to their request in three seconds, that's acceptable."

But an analyst who attended an Apple briefing last month called that "the straw that broke the camel's back." I've heard three seconds can be a lifetime," he said.

The servers forewarned new services that will be rolled out in the "client-client-server environment" of coming years, analysts said. These networks, linking AWS servers and desktop Macs to remote PowerBooks and personal digital assistants (PDAs), will depend on filtering and storing data, and messaging to help users manage the flow of information.

AppleShare, the company's upcoming server-based full-text search application, will eventually distribute information to Newtons as well as Macintoshes, Apple said.

"[AppleShare] opens up the concept of the PDA as a network terminal," InfoCorp's Brown said. "The client-client-server network will help people deal with information overload. That makes people incredibly more productive." □

## Cameras

From Page 1

The Fuji device costs about \$1,840, and compatible PCMCIA cards cost about \$540 each. It requires a \$1,580 reader to transfer files to a CPU.

- **Venus.** The lower-end camera, sources said, will retail for about \$500 and support a resolution of about 320 lines. Venus will be able to store about 20 images in static RAM and will connect to the user's CPU via a serial interface.

Apple reportedly is also working on a high-definition digital camera for release in 1994. According to sources, the company will have this product on technology from Canon U.S.A. Inc. of Lake Success, N.Y.

Canon this month unveiled a prototype high-definition digital device that functions like a single-lens reflex camera and works with Canon's standard lenses and accessories. The camera, which runs on a NiCad battery, includes a 1.3 million pixel imaging sensor and stores images in a 120-Mbyte hard disk memory pack, or

40-Mbyte and 80-Mbyte IC memory packs that can be connected to a CPU via a SCSI interface. Its electronic shutter speeds range from 0.125 to 0.00025 seconds. Canon refused to comment on any marketing plans for the camera.

Several companies have introduced portable digital cameras over the past three years, and observers said the market has a lot of potential.

**Photographer** Kurt Foss, a writer and consultant based in Madison, Wis., said, "Businesses have been using low-end digital cameras for some time for training and education, databases, and image management." For example, he said, a hospital could use them as part of a patient identification system.

"There are lots of applications where you need to capture images quickly and transmit them quickly," Foss said. "People who have put down the state of digital cameras to far have been thinking about print applications, and I think we're seeing that these nonprint applications are very viable." □



## Radius Rocket makes jump to Mac IIx

## Update supports 7.1, sound in QuickTime

By Neil McManus

San Jose, Calif. — Macintosh IIx users can now add Radius Rocket 68040 accelerators, thanks to a free RocketWare software upgrade shipping this week.

In addition to IIfx support, RocketWare 1.5 fixes other bugs. Rockets can now play back QuickTime movies with sound, run more reliably with System 7.1, and support Apple Ethernet cards and other types use

the A/ROSE (Apple Real-time Operating System Executive) system extension.

RocketWare 1.5, which is bundled with all Rockets, now incorporates software licensed from Apple that reportedly lets the Rocket copy the contents of the Mac's ROM to the cards' on-board RAM, enhancing performance. It also improves the speed of math operations with the Rocket 33.

The upgrade also lets Rocket users add compatible 2- and 4-Mbyte SIMM modules. Some third-party composite SIMMs are still incompatible with Rocket

cards because of space limitations.

In addition, Radius Inc. reduced the price of its Rocket 251 to \$1,199 from \$1,499. This accelerator uses a 25-MHz 68LC040 processor to speed NuBus-based Macs.

The Rocket 33, based on a 33-MHz 68040, remains priced at \$2,499.

RocketShare, a \$499 package that lets each accelerator card act as an autonomous Mac that can run programs independently of the host Mac, can be added to all Rockets.

Radius Inc. is at 1710 Ferme Drive, San Jose, Calif. 95131. Phone (408) 434-1010; fax (408) 434-9575. □

## Star Trek

From Page 1

The Apple software reportedly sits on top of an upcoming release of DR DOS, an MS-DOS alternative now owned by Novell Inc. Some observers have speculated that Novell and Apple may be hoping to offer DR DOS and the Mac-interface software as a client-to-server-based applications running under Unix, Novell's recently released Unix implementation. Together, they said, the products

could be positioned as an alternative to Microsoft Windows NT.

Most of the work involved in the translation has been completed, according to sources close to the new group. A major step still to be taken is the native implementation of AppleTalk on the 486. While the software protocol itself is portable, assumptions regarding available connectivity hardware that can safely be made about a Mac logic board cannot be made about a PC, and this has slowed development, sources said.

Applications reportedly will have to be recompiled to run on Star Trek.

Paul Johnson, an analyst with First Boston Corp. in New York, said, "DR DOS alone wasn't a strong contender against Windows, but a combination of DR DOS and a Mac Finder and interface would be a very viable alternative to Windows, especially in light of Microsoft's FTC (Federal Trade Commission) problems about OEM handling deals."

But Peter Hartsok, editor of The Hartsok Letter in Alameda, Calif., said he is incredulous that Apple is at work on something such as Star Trek when the company must dedicate much of its resources to implementing the Mac OS on the PowerPC. "If Apple had a bunch of engineers sitting around with nothing better to do, this would be a good experiment," he said. "But it sounds like a waste of time to me."



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### Illustrator

From Page 1

from the intersecting areas of two overlapping objects. Other Pathfinder filters include tools for combining, dividing and cropping objects.

Other plug-in filters make it possible to blend, mix and invert colors, draw complex shapes, such as stars and spirals, smooth and distort paths, and add drop shadows and calligraphic styles to paths.

► **Layers and custom views.** Version 5.0 will let users create, name and work in unlimited layers via a floating palette. Objects can be moved from layer to layer.

The new version will also let users set up and save custom views of a document, including the zoom level and layer setting. Users will be able to simultaneously view a portion of an image in rendered mode and another section in wireframe mode.

► **Floating palettes.** In addition to the Layers floating palette, Illustrator 5.0 adds floating Paint Style and Character palettes.

With the Paint Style palette, users will be able to quickly create, edit and save frequently used colors according to CMYK (cyan, magenta, yellow, black) values. In the current version, users must edit colors in a dialog box.

The Paint Style palette also includes three preset gradient fills that users can apply to objects just as they would a color or pattern.

Users will also be able to create new gradients by specifying beginning, middle- and end-colors and the angle of the blend. Illustrator 5.0 also automatically optimizes the blends for the user's output device, Adobe said.

The character palette will let users select typefaces, sizes and leading. The font name box offers clairvoyance, allowing users to type "f1" to access Helvetica.

► **Apple events.** Users will be able to double-click on an imported image, and Illustrator 5.0 automatically will launch the originating application via Apple events. Changes

## Rae builds new PIM on object architecture

Cupertino, Calif. — Recent start-up Rae Technology Inc. last week officially announced its existence and unveiled information about its proprietary architecture for creating information-management applications with sophisticated navigational links.

The object-oriented architecture incorporates a free-form data object manager, linking and navigation tools, and an assistance feature that helps users make connections between records (see MacWEEK, March 1).

Rae said it will ship its first commercial application by the end of the second quarter. The as-yet-unnamed program, aimed primarily at PowerBook users, will include contact-management, scheduling and note-taking capabilities, as well as the features provided by the underlying architecture. Prices will be competitive with other business applications, according to Rae.

Rae Technology, based here, was founded last September by a team of former Apple, Macromedia Inc. and TriTech Systems employees. □

made to the image in that application will be reflected in the Illustrator document.

► **Editing in preview.** Illustrator 5.0 will let users edit images in rendered mode. The current version requires users to return to the wireframe mode for editing.

Other new features include multiple levels of undo, interruptible redraw, automatic hyphenation, support for pressure-sensitive brushes and tablets, a calligraphic pen tool, and eyedropper and paint-bucket tools. The program will also ship with 40 Adobe Type 1 fonts.

"The best parts about the upgrade are the timesaving devices, like the custom color palette," said John Bee of The John Bee Show, an advertising illustration company in Irvine, Calif. "You don't have to use your menus all the time, and you can have little palettes all over the place. It's going to change the way I look at my illustrations, and it's going to expand the things I can offer to my clients."

"My clients come in and ask, 'Can you do a gradient fill?' I used to say, 'Yeah, but it'll take me all day.' Now I'll be going, 'Sure. No problem. Piece of cake,'" Bee said.

Upgrades will be available on floppies or as a CD-ROM that includes Adobe Separator, Type On Call, third-party clip art and QuickTime movies showing how to use Illustrator's new features.

Disk upgrades will be free to users who purchased Illustrator 3.2 after March 1; these users can buy the CD-ROM upgrade for \$99. Other registered users can upgrade to this disk version of Illustrator 5.0 for \$149 through Aug. 31; the upgrade price will then rise to \$199. The CD-ROM upgrade will be \$199 through Aug. 31 and \$249 thereafter.

Adobe Systems Inc. is at 1585 Charleston Road, P.O. Box 7000, Mountain View, Calif. 94039-7000. Phone (415) 961-4400 or (800) 344-3385; fax (415) 961-3769. □

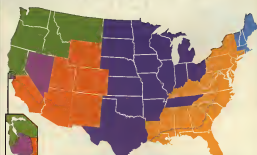
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## Looking ahead

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April 5	Electronic mail	March 25	March 23
April 12	<b>GA Spec. Rpt.</b> Video	April 1	March 30
April 19	Graphics hardware	April 8	April 6
April 26	<b>Printers</b> Monitors	April 15	April 13
May 3	Networking	April 22	April 20
May 10	Programming	April 29	April 27
May 17	<b>GW Spec. Rpt.</b> Sound	May 6	May 4
May 24	<b>MacWEEK 200</b> CD-ROM	May 13	May 11





In the spring, a young Knife's fancy lightly turns. And who could blame a young Knife for that, given the rather unfortunately dramatic turn that events, including the weather, took during winter's waning days.

## The importance of being speedy

The nice thing about doing a nice turn is that you often gain a new perspective. In the Knife's case, it's a perspective on speed. Even before the advent of today's often bloated applications, the Knife has always believed that the fastest Mac is the best Mac. And

apparently the wizards working on the first production incarnation of the PowerPC chip are of the same mind. They've not been shy to boast that the PowerPC 601 will feature some impressive clock speeds: one version at 50 MHz and another at 66 MHz.

But the Knife's trusty sources now say that the next round of pre-production PowerPC silicon may yield even more impressive figures.

The engineers are hoping that the performance range will begin at 66 MHz and top out at a much higher figure. If this turns out to be the case, the first RISC Macs could be considerably faster than expected, even in emulation mode.

This high level of performance also puts in an interesting new light Apple's stated goal of a PowerPC-based Mac capable of running off-the-shelf Mac applications at Quadra speeds and priced at less than \$2,000. Perceptive observers have been quick to point out that the Centris 610 almost fills that order already.

**capitalization optional.** Apple will be jockeying with other companies for your attention at next week's intermedia show in San Francisco. Among the many exciting and wondrous technological marvels on display will be a configuration bundle that Apple is calling a video-production workstation. Designed to promote multimedia CD-ROM development, the workstation will be based on a Centris 650 and include a Radius VideoVision plus Day's VideoShop 2.0 and Macromedia's MacroMind Director. This is only the first in a series of product bundles that Apple is rumored to have planned.

Attentive readers will remember that Radius VideoVision originally was developed at Apple as Touchstone, then sold to Radius. Now it's to make an appearance both in this bundle and in the upcoming Cyclone multimedia Macs.

**No Mac is a laurel.** If you think Apple's running unit-sales growth means the company can rest on its achievements, then you probably believe a lot of other hogwash, too. The truth is that the struggle for success is eternal, no matter how many units you moved last month or how many TV commercials your PowerBooks appear in. Take large accounts. Apple has won its share over the past couple of years, but if the Knife's sources are telling the truth, it's lost a few lately, too. For now we'll lay the loss of these accounts at the feet of the current downgrading craze and assume that Apple's ace corporate sales force is already hard at work reestablishing the famous Mac advantage where it really counts.

Along the same dark vein, the faint of heart may be disturbed by the news of the departure of two high-profile executives from the PowerBook group. The Knife's faith is unwavering, however, as it's truly difficult to imagine Dell Computer developing a product as innovative enough to mount a credible challenge to Apple's current dominance in the laptop field. Cheap enough, maybe, but not innovative enough. And Global Village historically runs in tandem with Apple.

On the other hand, it does seem lately that the executive suites of most of the fledgling pen-based computing companies are populated mainly by alumni of Apple USA. Does that say more about the future of pen-based computing or the quality of the work experience at Apple? □

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# Introducing DayStar's Charger. Fast Imaging for Today and Tomorrow!

Charger™ will change the way you work with images. Our goal is to make Mac imaging fast, predictable and easy... much like text is today.

The Charger solution is built on DayStar's expertise in Mac acceleration - clean, 100% compatible speeds that break the bottlenecks. We also bring you powerful new software from imaging workstations and a new kind of user interface.

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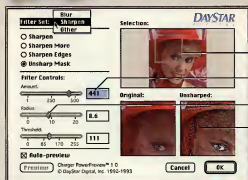
Beginning this spring, DayStar will offer even more Photoshop functions, and new "expansion modules" based on patented imaging technology from KEPS. All are upgradable from today's Charger!



## Charger Plug-Ins\*

Accelerated filters and functions for Adobe Photoshop™ 2.0 and 2.5, Adobe Premiere™ 2.0, Fractal Painter™ 2.0 and Fractal Sketcher™ 1.0. Gaussian Blur, Blur More, Sharpen Edges, Sharpen More, Unsharpen Mask, Despeckle, Find Edges, High Pass, Resize and Rotate.

Expansion module connectors



## Charger PowerPreview™

Eliminate the guesswork within Adobe Photoshop.

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Precision input

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See real-time effects



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## Charger Pro Module\*

Get even more speed and high-end "adaptive filters" from the KEPS Prophecy™ workstation. (due Spring '93)

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\*Digital Signal Processor (DSP) processing on all M68000. \*\*30 Day Money Back Guarantee is available through participating retailers only. Software subject to change. Adobe Photoshop not included.